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# Autonomous Weapons and Accountability: Seeking Solutions in the Law of War

Kelly Cass

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# **AUTONOMOUS WEAPONS AND ACCOUNTABILITY: SEEKING SOLUTIONS IN THE LAW OF WAR**

*Kelly Cass\**

*Autonomous weapons are increasingly used by militaries around the world. Unlike conventional unmanned weapons such as drones, autonomous weapons involve a machine deciding whether to deploy lethal force. Yet, because a machine cannot have the requisite mental state to commit a war crime, the legal scrutiny falls onto the decision to deploy an autonomous weapon. This Article focuses on the dual questions arising from that decision: how to regulate autonomous weapon use and who should be held criminally liable for an autonomous weapon's actions. Regarding the first issue, this Article concludes that regulations expressly limiting autonomous weapon use to non-human targets are preferable to a complete ban on autonomous weapons. Regarding the second issue, this Article concludes that in light of the legal constraints on autonomous weapon use and criminal punishment, the appropriate entities to hold criminally liable for an autonomous weapon's actions are the combatant who deployed the weapon and the commander who either supervised the combatant or ordered the deployment. Ultimately, this Article emphasizes that although the Law of War already restricts the legal use of autonomous weapons to non-human targets through the principle of distinction, both the International Criminal Court and individual states should clarify how they will enforce limitations on autonomous weapon use before the technology advances.*

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## TABLE OF CONTENTS

I. INTRODUCTION .....	1019
II. BACKGROUND .....	1022
A. Definition of Autonomous Weapons .....	1022
B. Advantages and Disadvantages of Autonomous Weapons .....	1027
C. Current Use and Future Development of Autonomous Weapons .....	1030
III. AUTONOMOUS WEAPONS AND THE LAW .....	1031
A. The Four Principles of the Law of War .....	1032
1. Military Necessity .....	1033
2. Distinction .....	1034
3. Proportionality .....	1037
4. Humanity .....	1038
B. Article 36 .....	1040
IV. REGULATION METHODS .....	1042
A. Ban on Autonomous Weapons .....	1042
B. Regulations Limiting the Use of Autonomous Weapons .....	1045
V. LIABILITY FOR THE FAILURES OF AUTONOMOUS WEAPONS .....	1048
A. Pecuniary Accountability .....	1049
1. The Manufacturer .....	1049
2. The Programmer .....	1052
3. The State .....	1052
B. Criminal Punishment .....	1054
1. War Crimes .....	1054
2. Potential Entities to Hold Criminally Liable .....	1057
a. The Robot .....	1057
b. The Operator .....	1058
c. The Commander .....	1064
VI. CONCLUSION .....	1066

## I. INTRODUCTION

Inevitably, the use of Hellfire missiles will occasionally result in civilian casualties.<sup>1</sup> Since the Hellfire missile's original production in the 1970s, both manned and unmanned aerial vehicles have employed its use.<sup>2</sup> If a Hellfire missile kills innocent civilians near a target in a proportionate attack by a manned vehicle, the combatant who deploys the missile would not be guilty of a war crime.<sup>3</sup> Why should the standard be any different when the combatant makes this proportionality decision from a location other than the aerial vehicle? Under the existing Law of War, it should not. Autonomous weapons, however, complicate the analysis.<sup>4</sup> An autonomous weapon is a computer-based weapon system capable of completing its missions, including identifying and engaging targets, without direct human control.<sup>5</sup> Unlike conventional unmanned weapons such as drones, autonomous weapons involve a machine deciding whether to deploy lethal force.<sup>6</sup> Yet, because a machine cannot have the requisite mental state to commit a war crime—a point that most scholarship has overlooked—the legal scrutiny falls onto the decision to deploy

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1. Mark Bowden, *The Killing Machine*, THE ATLANTIC (Aug. 14, 2013, 8:20 PM), <http://www.theatlantic.com/magazine/archive/2013/09/the-killing-machines-how-to-think-about-drones/309434/> (“No matter how precisely placed, when a 500-pound bomb or Hellfire missile explodes, there are sometimes going to be unintended victims in the vicinity.”).

2. *AMG-114 HELLFIRE Missile*, BOEING, <http://www.boeing.com/boeing/history/bna/hellfire.page> (last visited Dec. 16, 2013); see HUMAN RIGHTS WATCH & INT’L HUMAN RIGHTS CLINIC, *LOSING HUMANITY: THE CASE AGAINST KILLER ROBOTS* 22–23 (2012) [hereinafter HUMAN RIGHTS WATCH].

3. See UK MINISTRY OF DEF., *THE JOINT SERVICE MANUAL OF THE LAW OF ARMED CONFLICT* 25 (Oxford University Press, 2004). Another example of a proportional attack is: “[a] munitions factory may be such an important military objective that the death of civilians working there would not be disproportionate to the military gain achieved by destroying the factory.” *Id.*

4. See Robert Sparrow, *Killer Robots*, 24 J. APPLIED PHIL. 62, 66 (2007) [hereinafter *Killer Robots*].

5. U.S. DEP’T OF DEF., *DEPARTMENT OF DEFENSE DIRECTIVE 3000.09, AUTONOMY IN WEAPON SYSTEMS* 13–14 (Nov. 21, 2012) [hereinafter *DIRECTIVE 3000.09*] (“A weapon system that, once activated, can select and engage targets without further intervention by a human operator.”); ARMIN KRISHNAN, *KILLER ROBOTS: LEGALITY AND ETHICALITY OF AUTONOMOUS WEAPONS* 5 (2009); ROBIN R. MURPHY, *AN INTRODUCTION TO AI ROBOTICS* 4 (2000) (“‘Function autonomously’ indicates that the robot can operate, self-contained, under all reasonable conditions without requiring recourse to a human operator.”).

6. *UN Human Rights Expert Calls For A Moratorium on Lethal Autonomous Robots*, UNITED NATIONS HUMAN RIGHTS (May 30, 2013), <http://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=13380&LangID=E> [hereinafter *UN Human Rights Expert*].

an autonomous weapon.<sup>7</sup> This Article focuses on the dual questions arising from that decision: how to regulate autonomous weapons use and who should be held criminally liable for an autonomous weapon's actions.

Allowing machines to make lethal decisions without human oversight has sparked an international controversy.<sup>8</sup> The fear and uncertainty regarding autonomous weapons necessitate that regulations and accountability issues be defined now, before the technology advances.<sup>9</sup> Recognizing the immediate need of international diplomacy, numerous scholars have begun describing autonomous weapons as "killer robots."<sup>10</sup> Scholars use this phrase to raise public awareness about the potential consequences of allowing autonomous weapon technology to advance.<sup>11</sup> However, the term "killer robots" features "over-simplified" language describing "a possible worst case scenario."<sup>12</sup> While the slogan might work to gain attention, it presents the public with a distorted view of autonomous weapons.<sup>13</sup>

The true issue regarding autonomous weapons is not how to ban "killer robots," but rather how to regulate the current technology without stifling the potential benefits of future technology.<sup>14</sup> This Article argues that the means for regulating autonomous weapons already exists within customary international law: the principle of distinction. Under the principle of distinction, the use of present autonomous weapons against human targets would amount to an

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7. See Michael N. Schmitt & Jeffrey S. Thurnher, "Out of the Loop": *Autonomous Weapon Systems and the Law of Armed Conflict*, 4 HARV. NAT'L SEC. J. 231, 277 (2013).

8. See Richard Norton-Taylor, 'Killer Robots' Ban Must Be Part of Geneva Talks, Says Campaign Group, THE GUARDIAN (Nov. 12, 2013, 7:05 PM), <http://www.theguardian.com/science/2013/nov/13/geneva-talks-killer-robots-ban-campaign>; UN Human Rights Expert, *supra* note 6.

9. UN Human Rights Expert, *supra* note 6 (calling for a "collective pause worldwide" before allowing machines to make lethal decisions); see Gary E. Marchant et al., *International Governance of Autonomous Military Robots*, 12 COLUM. SCI. & TECH. L. R. 272, 314–15 (2011).

10. See Greg McNeal, *Fear and the Killer Robots Meme*, FORBES (Feb. 27, 2013, 6:59 PM), <http://www.forbes.com/sites/gregorymcneal/2013/02/27/fear-and-the-killer-robots-meme/>; see, e.g., KRISHNAN, *supra* note 5, at 1; HUMAN RIGHTS WATCH, *supra* note 2, at 1; *Killer Robots*, *supra* note 4, at 62.

11. McNeal, *supra* note 10.

12. *Id.* (internal quotation marks omitted) (quoting Tom Malinowski, an expert at Human Rights Watch—an organization that has launched a campaign against "Killer Robots").

13. See *id.*

14. See KENNETH ANDERSON & MATTHEW WAXMAN, LAW AND ETHICS FOR AUTONOMOUS WEAPON SYSTEMS: WHY A BAN WON'T WORK AND HOW THE LAWS OF WAR CAN 1–2 (2013).

indiscriminate attack, a war crime if it results in “loss of life or injury to civilians or damage to civilian objects.”<sup>15</sup> When a war crime is committed, the perpetrator must be held accountable, not only because it is legally required under customary international law,<sup>16</sup> but also because the failure to address accountability can lead to terrorist acts exacted by victims and their families seeking their own retribution.<sup>17</sup> This Article analyzes accountability issues associated with autonomous weapons, ultimately concluding that in light of the legal constraints on autonomous-weapon use and criminal punishment, the appropriate entities to hold criminally liable for an autonomous weapon’s actions are the combatant who deployed the weapon and the commander who either supervised the combatant or ordered the deployment.

To put the legal issues raised by autonomous weapons into the proper context, this Article starts out by defining autonomous weapons. Part II focuses on the different categories of autonomous weapons, their advantages and disadvantages, their current use, and their future development. Part III explores the legal framework applicable to autonomous weapons and specific legal issues raised by their use. Part IV discusses different regulation methods, concluding that regulations expressly limiting autonomous-weapon use to non-human targets are preferable to a complete ban on autonomous weapons. Part V lays out the need for accountability and the entities that might be held responsible for an autonomous weapon’s actions. Ultimately, Part VI concludes that although the Law of War already restricts the legal use of autonomous weapons to non-human targets through the principle of distinction, both the International Criminal Court and individual states should clarify how they will enforce limitations on autonomous-weapon use before the technology advances.

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15. JEAN-MARIE HENCKAERTS & LOUISE DOSWALD-BECK, CUSTOMARY INTERNATIONAL HUMANITARIAN LAW: VOLUME I: RULES 586, 589–90 (2009), available at <http://www.icrc.org/eng/assets/files/other/customary-international-humanitarian-law-i-icrc-eng.pdf> (Rule 156).

16. *Id.* at 551.

17. See Bowden, *supra* note 1.

## II. BACKGROUND

A. *Definition of Autonomous Weapons*

Without all its bells and whistles, an autonomous weapon is, in fact, no more than a robot.<sup>18</sup> A robot is a programmable machine capable of sensing and manipulating its surroundings.<sup>19</sup> The term “autonomy” denotes a machine’s capability to operate without human control.<sup>20</sup> Machines that require less human control are characterized as having more autonomy.<sup>21</sup> Thus, in general, an autonomous weapon is a machine capable of sensing and manipulating its surroundings with limited to no human control. Another term that needs defining is “unmanned system,” which is “a robotic sensor or weapon platform, which is reusable and thus not destroyed through its use.”<sup>22</sup> For example, a drone is an unmanned system because it returns to base to be reused another day, whereas a cruise missile is not an unmanned system because its very use destroys it.<sup>23</sup> The scope of this Article is limited to autonomous weapons that qualify as unmanned systems.

Robots can be used for innumerable tasks.<sup>24</sup> In the private sector, robots are used for service positions ranging from harvesting fruit to pumping gasoline.<sup>25</sup> Robots are also used in a military context.<sup>26</sup> In fact, “[a] significant proportion—perhaps even the majority—of contemporary robotics research is funded by the military.”<sup>27</sup> One goal of military robotic research is to develop autonomous weapons capable of complying with the Law of War,<sup>28</sup>

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18. See KRISHNAN, *supra* note 5, at 2.

19. *Id.* at 4.

20. KRISHNAN, *supra* note 5, at 4; MURPHY, *supra* note 5, at 4.

21. KRISHNAN, *supra* note 5, at 4; see Noel Sharkey, *Automating Warfare: Lessons Learned from the Drones*, 21 J.L. INF. & SCI. 140, 142 (2011) [hereinafter *Automating Warfare*] (“There is a continuum from fully controlled to fully autonomous . . .”).

22. KRISHNAN, *supra* note 5, at 5.

23. *Id.*

24. See Noel Sharkey, *The Ethical Frontiers of Robotics*, 322 SCI. 1800, 1800 (2008), available at <http://www.sciencemag.org/content/322/5909/1800.full>.

25. *Id.*

26. Robert Sparrow, *Building a Better WarBot: Ethical Issues in the Design of Unmanned Systems for Military Applications*, 15 SCI. & ENGINEERING ETHICS 169, 169 (2009) [hereinafter *Building a Better Warbot*].

27. *Id.*

28. Ronald C. Arkin, *The Case for Ethical Autonomy in Unmanned Systems*, 9 J. MIL. ETHICS 32, 339 (2010), available at <http://www.tandfonline.com/doi/abs/10.1080/15027570.2010.536402>.

the international law controlling armed conflicts.<sup>29</sup> Because the term autonomy encompasses a broad range of capabilities, different agencies categorize robots by their various degrees of autonomy.<sup>30</sup> In general, autonomous weapons are classified as remotely controlled, automated, or fully autonomous.<sup>31</sup>

Remotely controlled, or tele-operated, robots are controlled by a human operator through radio signals.<sup>32</sup> The operator “must have some type of display and control mechanisms, while the . . . [robot] must have sensors, effectors, power, and in the case of mobile robots, mobility.”<sup>33</sup> Two examples of remotely controlled autonomous weapons are the Predator and the Reaper, unmanned drones equipped with Hellfire missiles.<sup>34</sup> Pilots and sensor operators remotely control the drones,<sup>35</sup> which utilize sensor systems to obtain information.<sup>36</sup> The information is then analyzed by a remote sensor-operator to, among other tasks, identify potential targets.<sup>37</sup> Ultimately, a human—not the remotely controlled weapon—decides whether to use deadly force against identified targets.<sup>38</sup>

Automated robots, by contrast, do not require direct human control.<sup>39</sup> Instead, “[a]n [automated] robot carries out a pre-programmed sequence of operations or moves in a structured environment.”<sup>40</sup> An example of an automated robot is the U.S.

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29. UK MINISTRY OF DEF., *supra* note 3, at 3–4. The Law of War is also referred to as the Law of Armed Conflict. *See id.* For the sake of simplicity, this Article will refer to this body of law as the Law of War.

30. *Automating Warfare*, *supra* note 21, at 142 (describing how “[t]he [U.S.] Army has ten levels [of autonomy] while the Air Force has four”).

31. Darren M. Stewart, *New Technology and the Law of Armed Conflict*, 87 INT’L L. STUD. 271, 276 (2011).

32. *Id.*

33. MURPHY, *supra* note 5, at 28.

34. HUMAN RIGHTS WATCH, *supra* note 2, at 22–23; NOEL SHARKEY, RUSI DEF. SYS., GROUNDS FOR DISCRIMINATION: AUTONOMOUS ROBOT WEAPONS 87 (2008) [hereinafter *Grounds for Discrimination*], available at <http://www.rusi.org/downloads/assets/23sharkey.pdf>; Stewart, *supra* note 31, at 276.

35. Chris Powell, *We Are Not Drones*, AIRMAN (Oct. 21, 2013), <http://airman.dodlive.mil/2013/10/we-are-not-drones/>.

36. JOHN COTTON ET AL., AFRL-SA-WP-TR-2011-0006: MULTIPLE APTITUDE NORMATIVE INTELLIGENCE TESTING THAT DISTINGUISHES U.S. AIR FORCE MQ-1 PREDATOR SENSOR OPERATORS FROM PEERS IN THE CIVILIAN GENERAL POPULATION AND AC-130 GUNSHIP SENSOR OPERATORS 2 (2011), available at <http://www.dtic.mil/dtic/tr/fulltext/u2/a550819.pdf>.

37. *Id.* at 2–3.

38. *Grounds for Discrimination*, *supra* note 34, at 87.

39. Stewart, *supra* note 31, at 276.

40. *Automating Warfare*, *supra* note 21, at 141.



Navy's MK 15-Phalanx Close-In Weapons System,<sup>41</sup> which "automatically detects, evaluates, tracks, engages, and performs kill assessments against [anti-ship missiles] and high-speed aircraft threats."<sup>42</sup> The legal fear associated with automated weapons is that the robot will perform properly as designed, but that the design will render it incapable of complying with the Law of War.<sup>43</sup> For example, an automated weapon may be deployed in a densely populated area where it targets both combatants and civilians alike, not because of a performance failure, but rather because it was not designed with the ability to distinguish between combatants and civilians.<sup>44</sup> Moreover, while automated robots do exist, there is still room for the technology to advance before it reaches the next category of autonomy: fully autonomous robots.<sup>45</sup>

Fully autonomous robots, which are still under development and not yet in existence, will be artificially intelligent robots able to act without human control.<sup>46</sup> Scholars have not reached a consensus on the definition of artificial intelligence.<sup>47</sup> However, the study of artificial intelligence robotics analyzes robotic "learning, planning, reasoning, problem solving, knowledge, representation, and computer vision."<sup>48</sup> In this Article, the phrase "fully autonomous" is used to describe robots capable of performing such tasks. Fully autonomous robots will "be capable of making their own decisions, for instance, about their target, or their approach to their target."<sup>49</sup> More importantly, these fully autonomous robots will be able to use their artificial intelligence to "learn from experience."<sup>50</sup> The decisions of a fully autonomous robot will be made in accordance with a pre-programmed reasoning system; however, this reasoning system will evolve as the robot is exposed to varying situations from which it can learn.<sup>51</sup>

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41. *See id.*

42. *MK 15-Phalanx Close-In Weapon System (CIWS)*, AMERICA'S NAVY, [http://www.navy.mil/navydata/fact\\_display.asp?cid=2100&tid=487&ct=2](http://www.navy.mil/navydata/fact_display.asp?cid=2100&tid=487&ct=2) (last updated Nov. 15, 2013).

43. *See* Schmitt & Thurnher, *supra* note 7, at 278.

44. *See id.*

45. *See Killer Robots*, *supra* note 4, at 64–65.

46. *See* HUMAN RIGHTS WATCH, *supra* note 2, at 3; *Killer Robots*, *supra* note 4, at 65; Stewart, *supra* note 31, at 276.

47. MURPHY, *supra* note 5, at 15.

48. *Id.* at 16.

49. *Killer Robots*, *supra* note 4, at 65.

50. *Id.*

51. *See id.*

The legal fear associated with fully autonomous weapons is that, due to the robot's evolved reasoning, humans will not be able to predict the robot's actions.<sup>52</sup> In the worst-case scenario, fully autonomous weapons intentionally target civilians based on their evolved reasoning process—a reasoning process created through adaptation rather than by programmers.<sup>53</sup> Thus, the real fear is that a fully autonomous weapon will use force against the wrong targets, and—due to the weapon acting based on an evolved reasoning process as opposed to the one it was originally programmed with—their human operator and commander will not know why.<sup>54</sup>

However, it is still unknown whether this technology and this scenario will ever exist. Some scholars predict that robots incorporating artificial intelligence, fully autonomous robots, will exist “before the end of the century.”<sup>55</sup> Yet, others argue that artificial intelligence will never exist.<sup>56</sup>

The scope of this Article is limited to automated and fully autonomous robots. Rather than analyze the two categories separately, this Article focuses on issues common to both. Unlike remotely controlled robots, automated and fully autonomous robots deploy lethal force based on their programs rather than human commands.<sup>57</sup> Allowing robots to make lethal decisions necessitates that rules be in place to regulate the existing technology and guide its future development.<sup>58</sup> As such, the recommendations proposed by this Article are applicable to existing automated robots, as well as future automated and fully autonomous robots. For clarity and to align itself with other scholarship, this Article utilizes the term “autonomous” to refer to both automated and fully autonomous robots.

It is important to note that today's robots do not make decisions the same way humans do: they do not “think.”<sup>59</sup> Even artificially intelligent robots (if they ever exist) will make decisions based on

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52. *Id.*

53. *See id.* at 65–66.

54. *See id.*

55. *Id.* at 64.

56. MURPHY, *supra* note 5, at 16.

57. *Grounds for Discrimination*, *supra* note 34, at 87; *Killer Robots*, *supra* note 4, at 65; Stewart, *supra* note 31, at 276.

58. *See UN Human Rights Expert*, *supra* note 6.

59. *Automating Warfare*, *supra* note 21, at 142.

“IF/THEN statement[s].”<sup>60</sup> This statement “can be as simple as, IF object on left, THEN turn right,” or as complicated as certain sensor reactors triggering “a different sub-program to help with the decision.”<sup>61</sup>

In his article *Minds, Brains, and Programs*, John R. Searle uses an illustration involving the Chinese language to argue that it is not possible for a computer—the “equivalent [of] a [robot’s] nervous system”<sup>62</sup>—to think.<sup>63</sup> Pretend that a person who does not know Chinese is locked in a room with a page of paper containing Chinese characters and a manual written in the person’s native language. The manual instructs the person on how to write the appropriate Chinese characters underneath the already existing characters. However, the instructions relate to the characters’ *shapes* rather than their *meanings*. Once the assignment is complete, the person delivers the finished page to individuals not in the room. To the individuals reviewing the page, the person appears to know Chinese, when in actuality the person has no idea what the page says.<sup>64</sup> In the same manner, a robot can be programmed to carry out actions without knowing the meaning of the actions.<sup>65</sup> Searle concludes that just because a computer can “produce[] output that simulates understanding,”<sup>66</sup> does not mean that the computer can think.<sup>67</sup> Accordingly, although an autonomous robot can replicate human actions, programming—rather than thought—dictates the robot’s decisions.<sup>68</sup>

A final point to stress is that although autonomous weapons can accomplish tasks without human supervision, there is still human involvement in the overall mission.<sup>69</sup> Humans still make at least two crucial decisions: whether to authorize the use of autonomous

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60. *Id.*

61. *Id.*

62. MURPHY, *supra* note 5, at 3.

63. John R. Searle, *Minds, Brains, and Programs*, 3 BEHAV. & BRAIN SCI. 417, 417–20, 422 (1970), available at <http://www.class.uh.edu/phil/garson/MindsBrainsandPrograms.pdf>; Lawrence B. Solum, *Legal Personhood for Artificial Intelligences*, 70 N.C. L. REV. 1231, 1236–1237 (1992), available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1108671](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1108671).

64. Example adopted from Searle, *supra* note 63, at 417–20, and Solum, *supra* note 63, at 1236. This hypothetical is a variation on the original and more complex hypothetical.

65. Searle, *supra* note 63, at 422.

66. Solum, *supra* note 63, at 1237.

67. Searle, *supra* note 63, at 417, 422.

68. *See id.* at 417.

69. Schmitt & Thurnher, *supra* note 7, at 277.

weapons and whether to ultimately deploy autonomous weapons.<sup>70</sup> Thus, this Article defines an autonomous weapon as a reusable robot capable of completing tasks and making decisions to deploy force without human control, but it does not go so far as to consider the potential of robots commanding and controlling overall military actions.

*B. Advantages and Disadvantages of  
Autonomous Weapons*

*Armed conflict continues to be an unpredictable, often base affair, where significant ambiguity prevails, notwithstanding the employment of considerable technological capability. The benefits afforded by new technology in such circumstances are significant if they can ameliorate even some of the suffering caused by armed conflict, but they are by no means a panacea.*<sup>71</sup>

Autonomous weapons provide myriad advantages over human soldiers, such as “longer range, greater persistence, longer endurance, higher precision; faster target engagement; and immunity to chemical and biological weapons.”<sup>72</sup> Additionally, autonomous weapons do not have to struggle with the concept of self-defense.<sup>73</sup> For example, if an unknown person approaches an autonomous robot with a drawn weapon, the robot does not have to make a split-second decision on whether to deploy force before the person does.<sup>74</sup> Instead, the robot can take the extra seconds required to identify the person before deciding to deploy force.<sup>75</sup>

An important advantage is that the destruction of an autonomous weapon is preferable to the loss of a human life, which also provides a political advantage.<sup>76</sup> Less casualties, both American and foreign, might translate into more political support for an armed conflict.<sup>77</sup> The United States is in a unique predicament: it is required to be a military super power, while at the same time it must minimize the

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70. See *id.* at 277–78, 280.

71. Stewart, *supra* note 31, at 293.

72. Arkin, *supra* note 28, at 334.

73. *Id.* at 333.

74. See *id.*

75. See *id.*

76. See Marchant et al., *supra* note 9, at 288; *Killer Robots*, *supra* note 4, at 64.

77. See Marchant et al., *supra* note 9, at 288; *Killer Robots*, *supra* note 4, at 64.

number of soldiers' lives lost.<sup>78</sup> Autonomous weapons provide an answer to this dilemma.<sup>79</sup> Autonomous weapons offer the U.S. military "the capability to continue to project power with fewer casualties, and to do so because culture and society" demand it.<sup>80</sup>

Autonomous weapons possess another advantage that cannot be ignored—a quicker reaction time than the fastest human soldier could ever muster.<sup>81</sup> The advantage of speed gives nations a strong motive to develop autonomous weapons.<sup>82</sup> The speeds at which autonomous weapons can analyze data to make both target and force deployment decisions might be too fast for a human to adequately respond to.<sup>83</sup> As a result, "[w]eapons that require human oversight are likely to be at a substantial disadvantage in combat with [similar] systems that can do without."<sup>84</sup> Therefore, speed is an invaluable advantage of autonomous weapons.

In addition to the tactical and political advantages, autonomous weapons potentially provide ethical advantages as well. In his paper "The Case for Ethical Autonomy in Unmanned Systems," Professor Ronald C. Arkin argues that autonomous weapons might exhibit more ethical behavior than their human counterparts.<sup>85</sup> In support of his argument, Arkin points to a 2006 Surgeon General's Office report that found that "[a]pproximately 10 percent of Soldiers and Marines [deployed in Operation Iraqi Freedom] report mistreating noncombatants."<sup>86</sup> The report additionally found that soldiers with "high levels of anger . . . [are] nearly twice as likely to mistreat noncombatants."<sup>87</sup> Autonomous weapons, by contrast, are not hindered with emotions, and thus might be able to carry out combatant duties with more ethical behavior.<sup>88</sup>

On the other hand, there are a number of disadvantages associated with autonomous weapons.<sup>89</sup> A daunting disadvantage is

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78. Marchant et al., *supra* note 9, at 288.

79. *Id.*; *Killer Robots*, *supra* note 4, at 64.

80. Marchant et al., *supra* note 9, at 288.

81. See Arkin, *supra* note 28, at 333; *Killer Robots*, *supra* note 4, at 68.

82. *Killer Robots*, *supra* note 4, at 69.

83. Arkin, *supra* note 28, at 333; *Killer Robots*, *supra* note 4, at 68.

84. *Killer Robots*, *supra* note 4, at 69.

85. Arkin, *supra* note 28, at 332.

86. *Id.* at 334–35.

87. *Id.* at 335.

88. *Id.* at 333.

89. See Marchant et al., *supra* note 9, at 282–84.

that “full awareness of the risks from autonomous robots may be impossible.”<sup>90</sup> Programmers cannot always accurately predict how computer-based systems will behave.<sup>91</sup> Additionally, system malfunctions, part failures, and internal errors can occur when working with computer-based systems.<sup>92</sup> Moreover, advanced technology poses the risk of “emergent behaviors”: “behaviors not programmed but arising out of sheer complexity.”<sup>93</sup> The counterargument is that human behavior is not always predictable.<sup>94</sup> Specifically, soldiers often experience fear and panic, emotions that can lead to unpredictable behavior.<sup>95</sup> However, while commanders have experience in unpredictable human reactions to fear, as of now, they have limited familiarity with autonomous weapons acting unpredictably.<sup>96</sup> Consequently, at the very least, the unpredictability of autonomous weapons is a disadvantage because it presents commanders with situations they are unaccustomed to.<sup>97</sup>

Scholars stress that a primary concern is whether autonomous weapons will be capable of fully distinguishing between different categories of humans.<sup>98</sup> Currently, “[t]here are no visual or sensing systems” that can accurately decide whether a human is a combatant or noncombatant.<sup>99</sup> Rather than an outright disadvantage, however, this limitation might simply put robots on par with soldiers in this respect.<sup>100</sup> After all, humans are not necessarily better at deciphering whether someone is a combatant.<sup>101</sup> Still, it is particularly

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90. *Id.* at 283.

91. *Id.* at 284.

92. *Id.* at 283–84.

93. *Id.* at 284.

94. *See* Arkin, *supra* note 28, at 333.

95. *Id.*

96. Unlike human soldiers, autonomous weapons are relatively new. Thus, any experience with the unpredictable nature of autonomous weapons is limited to the years that autonomous weapons have been in existence. *See* DEP’T OF DEF., UNMANNED SYSTEMS INTEGRATED ROADMAP: FY2011–2036 13 (2011) [hereinafter ROADMAP], available at <http://www.defenseinnovationmarketplace.mil/resources/UnmannedSystemsIntegratedRoadmapFY2011.pdf> (describing how unmanned systems have become more popular “[o]ver the past decade”).

97. *See* Stewart, *supra* note 31, at 292 (asserting that “what is unusual or different is often seen as complex and difficult”).

98. *Automating Warfare*, *supra* note 21, at 143; *UN Human Rights Expert*, *supra* note 6.

99. *Automating Warfare*, *supra* note 21, at 143.

100. *See* Arkin, *supra* note 28, at 333.

101. *See id.*; Drew Cohen, *Autonomous Drones and the Ethics of Future Warfare*, HUFFINGTON POST (Dec. 15, 2013, 1:48 PM), [http://www.huffingtonpost.com/drew-f-cohen/autonomous-drones-and-the\\_b\\_4428112.html](http://www.huffingtonpost.com/drew-f-cohen/autonomous-drones-and-the_b_4428112.html).

troublesome that autonomous weapons might not ever be capable of making this distinction.<sup>102</sup>

Regardless of the disadvantages, states are still actively working towards developing and deploying autonomous weapons.<sup>103</sup> Advancing technology has been an issue of war for hundreds of years.<sup>104</sup> When faced with “developments in the means and methods of warfare . . . belligerents have either developed enhanced weapons or tactics, or suffered defeat.”<sup>105</sup> Subsequently, expecting states to refrain from deploying autonomous weapons in the future is unrealistic.<sup>106</sup> According to Arkin, “[t]he trend is clear: warfare will continue and autonomous robots will ultimately be deployed in its conduct.”<sup>107</sup>

### *C. Current Use and Future Development of Autonomous Weapons*

The use of robots, specifically remotely controlled robots, by the United States military has increased significantly since the turn of the century.<sup>108</sup> For example, an estimated 8,000 unmanned ground systems have been deployed in more than 125,000 missions during Operation Enduring Freedom and Operation Iraqi Freedom.<sup>109</sup> Similarly, “[i]n May 2010 unmanned [aircraft] systems surpassed one million flight hours and in November 2010 achieved one million combat hours.”<sup>110</sup> In light of the combat advantages provided by military robots, the United States Department of Defense “has allocated an increasing percentage of its budget to developing and acquiring these systems.”<sup>111</sup>

The United States is not the only country developing robots for military use.<sup>112</sup> According to Professor Noel Sharkey, “at least [fifty] other countries have either bought [military robots] or have military

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102. *See Automating Warfare*, *supra* note 21, at 143–44.

103. *Id.* at 144.

104. Stewart, *supra* note 31, at 271.

105. *Id.*

106. *See Building a Better Warbot*, *supra* note 26, at 185.

107. Arkin, *supra* note 28, at 332.

108. ROADMAP, *supra* note 96, at 13.

109. *Id.* at 22.

110. *Id.*

111. *Id.* at 13.

112. Stewart, *supra* note 31, at 280.

robotics [programs].”<sup>113</sup> Specifically, military robots, the majority of which are remotely operated, “are currently being developed and deployed by nations including the United States, Israel, South Korea, Britain, France, Germany, Denmark, Sweden, China, and India.”<sup>114</sup> Due to the international interest in developing robotic weapons, there is a good chance that robots will play a much bigger part in future military operations.<sup>115</sup>

The future use and research of autonomous weapons raise many questions.<sup>116</sup> Will the current research on autonomous weapons lead to an arms race?<sup>117</sup> Will the use of autonomous weapons by one country force others to deploy autonomous weapons?<sup>118</sup> Will the use of autonomous weapons create a new generation of warfare in which only militaries with the most advanced technology stand a chance of victory?<sup>119</sup> The answers to these questions are not yet clear. What is clear is that states are creating the parameters for autonomous-weapon use now.<sup>120</sup> For example, in November 2012, the United States released a Department of Defense Directive detailing the situations in which “[s]emi-autonomous weapon systems. . .[h]uman-supervised autonomous weapon systems. . .[and] [a]utonomous weapon systems may be used.”<sup>121</sup> However, before creating such parameters, states should consider what restrictions the Law of War already places on autonomous-weapon use.<sup>122</sup>

### III. AUTONOMOUS WEAPONS AND THE LAW

*“[I]f man does not master technology, but allows it to master him, he will be destroyed by technology.”<sup>123</sup>*

The legality of autonomous weapons is a subject of public debate.<sup>124</sup> It is not entirely clear how states should apply the Law of

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113. *Automating Warfare*, *supra* note 21, at 140.

114. *Building a Better Warbot*, *supra* note 26, at 170.

115. *Id.* at 185.

116. *Id.* at 170.

117. *Id.*

118. *Id.*

119. *Id.*

120. *See* DIRECTIVE 3000.09, *supra* note 5, at 3.

121. *Id.* (emphasis added).

122. *See* Schmitt & Thurnher, *supra* note 7, at 233–34.

123. INT’L COMM. OF THE RED CROSS, COMMENTARY ON THE ADDITIONAL PROTOCOLS OF 8 JUNE 1977 TO THE GENEVA CONVENTIONS OF 12 AUGUST 1949 428 (1987).

124. *See* Stewart, *supra* note 31, at 281; Norton-Taylor, *supra* note 8; *UN Human Rights Expert*, *supra* note 6.



War to autonomous weapons.<sup>125</sup> However, the Law of War is meant to be flexible, an important point in analyzing the legality of autonomous weapons.<sup>126</sup> The Law of War consists of both specific rules and general principles, the latter allowing the law to address the legality of emerging technology even without specific rules responding to newly developed weapons.<sup>127</sup> Consequently, applying the Law of War to new weapons is complicated not because new weapons are beyond its scope, but rather because the process of applying Law of War principles to a new subject matter requires ingenuity.<sup>128</sup> This section and the next seek to apply the existing Law of War to autonomous weapons.

#### *A. The Four Principles of the Law of War*

The Law of War has two sources: treaty law and customary international law.<sup>129</sup> Treaty law consists of “rules expressly agreed upon by states in international treaties which are only binding on states party to those treaties.”<sup>130</sup> Customary international law, by comparison, “consists of the rules which, as a result of state practice over a period of time, have become accepted as legally binding.”<sup>131</sup> Once a rule becomes customary international law, it is applicable to all states.<sup>132</sup> Thus, if a treaty law provision becomes customary international law, all states are bound by the provision regardless if they were party to the original treaty.<sup>133</sup> Within customary international law are the four principles of the Law of War.<sup>134</sup>

Military necessity, distinction, proportionality, and humanity are the measuring stick for determining the legality of new military technology.<sup>135</sup> These principles, collectively known as the four principles of the Law of War, are customary international law, and consequently, applicable to all states.<sup>136</sup> Therefore,

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125. See *UN Human Rights Expert*, *supra* note 6.

126. See Stewart, *supra* note 31, at 272, 288–89.

127. *Id.*; see UK MINISTRY OF DEF., *supra* note 3, at 4.

128. Stewart, *supra* note 31, at 292–93.

129. UK MINISTRY OF DEF., *supra* note 3, at 4, 427.

130. *Id.*

131. *Id.* at 5.

132. *Id.* at 427.

133. *Id.*

134. *Id.* at 19; HUMAN RIGHTS WATCH, *supra* note 2, at 24.

135. Stewart, *supra* note 31, at 272; see also HUMAN RIGHTS WATCH, *supra* note 2, at 24.

136. UK MINISTRY OF DEF., *supra* note 3, at 427; HUMAN RIGHTS WATCH, *supra* note 2, at 24.

autonomous-weapon use by any state must comply with the four principles.<sup>137</sup> Like the majority of the Law of War, these principles are “flexible.”<sup>138</sup> They are adaptable to novel situations presented by new military technology.<sup>139</sup> As such, this Article next analyzes the four principles as applied to autonomous weapons.

### 1. Military Necessity

Military necessity is a threshold condition for the deployment of force.<sup>140</sup> The principle:

[P]ermits a state engaged in armed conflict to use only that degree and kind of force, not otherwise prohibited by the law of armed conflict, that is required in order to achieve the legitimate purpose of the conflict, namely the complete or partial submission of the enemy at the earliest possible moment with the minimum expenditure of life and resources.<sup>141</sup>

It is unlawful per se to deploy force in such a way as to violate the principal of necessity.<sup>142</sup> Consequently, the requirements of military necessity must be proven before proceeding to analyze whether the envisioned use of force complies with all other Law of War rules.<sup>143</sup>

Does the principle of military necessity allow for the use of autonomous weapons? To comply with military necessity, the force exerted by autonomous weapons must be limited to the force necessary to accomplish the “legitimate purpose of the conflict.”<sup>144</sup> Allowing autonomous weapons to use unlimited amounts of force could potentially violate the principle if autonomous weapons exert more force than is necessary.<sup>145</sup> One way to limit such force is by constraining the type of force autonomous weapons can apply. For example, under United States policy, autonomous weapons “may

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137. Vik Kanwar, *Post-Human Humanitarian Law: The Law of War in the Age of Robotic Weapons*, 2 HARV. NAT'L SEC. J. 616, 623 (2011).

138. Stewart, *supra* note 31, at 272 (asserting that one of the significant features of the law of armed conflict has been its “evolutionary flexibility”).

139. *Id.*

140. See UK MINISTRY OF DEF., *supra* note 3, at 22 (indicating that “the use of force which is not necessary is unlawful”).

141. *Id.* at 21–22.

142. *Id.* at 22.

143. See *id.*

144. See *id.* at 21–22.

145. See *id.* at 22.

[only] be used to apply non-lethal, non-kinetic force, such as some forms of electronic attack.”<sup>146</sup> Another way to limit such force is to restrain the use of autonomous weapons to only certain situations.<sup>147</sup> For example, autonomous-weapon use could be restricted to “environments likely to contain few or no civilians, or only for certain functions likely to pose little risk of damage to civilian property.”<sup>148</sup> Such restrictions might result in autonomous-weapon use that avoids unnecessary killing and destruction.<sup>149</sup> Thus, the use of an autonomous weapon can potentially comply with military necessity if such use is limited so that the autonomous weapon does not exert more force than is necessary.

As a practical matter, states may argue that they *need* to use autonomous weapons.<sup>150</sup> Due to the number of advantages associated with autonomous weapons, states may argue that they need to deploy autonomous weapons in order to win their current conflict.<sup>151</sup> Standing alone, however, a state’s perceived “need” to use autonomous weapons does not rise to the level of “military necessity” mandated by the Law of War to legally justify the unrestricted use of autonomous weapons.<sup>152</sup> To fulfill the principle of military necessity, states still must first show that the proposed use of autonomous weapons will accomplish their valid military goals “with the minimum expenditure of life and resources.”<sup>153</sup> Additionally, to comply with military necessity, states must prove that the proposed use of force is permissible under the remaining Law of War.<sup>154</sup>

## 2. Distinction

The principle of distinction requires combatants to direct attacks only at military targets.<sup>155</sup> Consequently, combatants need to be able

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146. DIRECTIVE 3000.09, *supra* note 5, at 3.

147. ANDERSON & WAXMAN, *supra* note 14, at 6, 13.

148. *Id.* at 13.

149. *See id.*

150. *See* UK MINISTRY OF DEF., *supra* note 3, at 23.

151. *See id.*; *Killer Robots*, *supra* note 4, at 69.

152. *See* UK MINISTRY OF DEF., *supra* note 3, at 23.

153. *See id.* at 21–22.

154. *Id.*

155. *Id.* at 24; Tony Gillespie & Robin West, *Requirements for Autonomous Unmanned Air Systems Set by Legal Issues*, 4 INT’L C2 J. 1, 11 (2010). The principle of distinction is codified in Article 51(4) of Additional Protocol 1. Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts (Protocol 1) art. 51(4), June 8, 1977, 1125 U.N.T.S. 3 [hereinafter Additional Protocol 1].

to distinguish combatants from noncombatants (including civilians), and military objects from civilian objects to ensure compliance with the principle.<sup>156</sup> Attacks that do not make these distinctions—commonly referred to as indiscriminate attacks—violate the Law of War.<sup>157</sup> Additionally, attacks involving weapons—the use of which cannot be restricted only to legal targets—are classified as indiscriminate attacks.<sup>158</sup> Because current technology cannot decipher between legitimate and non-legitimate military targets, the principle of distinction is the most problematic for autonomous weapons.<sup>159</sup>

“The problem with modern robotics is there’s no way a robot can discriminate between a civilian and a soldier . . . [t]hey can just about tell the difference between a human and a car.”<sup>160</sup> A robot’s sensors are mainly comprised of “cameras, infrared sensors, sonars, lasers, temperature sensors[,] and ladars [(laser radar)]<sup>161</sup> . . .”<sup>162</sup> Presently, information gained from these sensors can communicate little beyond the vague classification of human or non-human.<sup>163</sup> Even robotic systems that *can* recognize faces are currently of little use in a military context. There is no database that contains images of enemy combatant faces. Thus, no matter how advanced facial recognition technology becomes, such recognition would prove useless during warfare because an autonomous weapon still could not decipher between civilians and enemy combatants.

Lack of a precise definition for the term “civilian” further complicates the matter.<sup>164</sup> As opposed to defining what a civilian is, Additional Protocol 1 to the Geneva Convention (“Additional Protocol 1”) defines a civilian by listing what a civilian is not,<sup>165</sup> basically boiling down the definition that a civilian is “someone who

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156. UK MINISTRY OF DEF., *supra* note 3, at 24; Gillespie & West, *supra* note 155, at 11.

157. HUMAN RIGHTS WATCH, *supra* note 2, at 24.

158. Additional Protocol 1, *supra* note 155, art. 51(4).

159. HUMAN RIGHTS WATCH, *supra* note 2, at 30; see *Automating Warfare*, *supra* note 21, at 143–44.

160. Nidhi Subbaraman, *Activists, UN Put ‘Killer Robots’ in the Crosshairs*, NBC NEWS TECH. (April 29, 2013, 6:30 PM), <http://sys03-public.nbcnews.com/technology/activists-un-put-killer-robots-crosshairs-6C9633925> (quoting Noel Sharkey).

161. *Laser Radar (LADAR) Guidance System*, DEF. UPDATE, <http://defense-update.com/products/l/ladar.htm> (last updated May 24, 2006).

162. *Grounds for Discrimination*, *supra* note 34, at 88.

163. *Id.*

164. *Automating Warfare*, *supra* note 21, at 143.

165. Additional Protocol 1, *supra* note 155, art. 50.

is not a combatant.”<sup>166</sup> This description does not provide programmers with a workable definition.<sup>167</sup> Using this definition, a programmer would only be able to program an autonomous weapon with an ambiguous instruction like: IF not a combatant, THEN do not trigger.<sup>168</sup> Such an instruction would not provide the autonomous weapon with enough information to determine if someone is a civilian, and consequently, whether or not to use force.<sup>169</sup>

Despite these limitations, it still may be possible to utilize autonomous weapons in compliance with the principle of distinction.<sup>170</sup> Professors Kenneth Anderson and Matthew Waxman argue that as the technology advances, combatants will initially deploy autonomous weapons only against other computerized weapons or only in situations where civilians are scarce, such as undersea attacks.<sup>171</sup> Autonomous weapons might comply with the principle of distinction under these constraints because autonomous weapons can distinguish between objects. For example, the U.S. Navy’s MK 60 Encapsulated Torpedo (CAPTOR) uses an acoustic detection system to differentiate between hostile and friendly submarines.<sup>172</sup> Although these situations still present risks of discrimination errors, the chance of such errors in the above circumstances is lower than the chance of discrimination errors in metropolitan settings.<sup>173</sup>

The United States appears to adopt this point of view. A U.S. Department of Defense directive released in November 2012 authorized the use of autonomous weapons, under human supervision, to “select and engage” only non-human targets.<sup>174</sup> Thus, even though autonomous weapons cannot yet distinguish between humans, autonomous weapons can potentially comply with the principle of distinction if they are deployed in appropriate environments under the appropriate restrictions.

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166. *Automating Warfare*, *supra* note 21, at 143; see Additional Protocol 1, *supra* note 155, art. 50.

167. *Automating Warfare*, *supra* note 21, at 143.

168. *Id.*

169. *See id.*

170. *See* ANDERSON & WAXMAN, *supra* note 14, at 11; Cohen, *supra* note 101.

171. ANDERSON & WAXMAN, *supra* note 14, at 6.

172. *MK 60 Encapsulated Torpedo (CAPTOR)*, FED’N OF AM. SCIENTISTS (Dec. 13, 1988, 7:50 AM), <http://www.fas.org/man/dod-101/sys/dumb/mk60.htm>.

173. ANDERSON & WAXMAN, *supra* note 14, at 6.

174. DIRECTIVE 3000.09, *supra* note 5, at 3.

### 3. Proportionality

The third principle of the Law of War, proportionality, prohibits combatants from carrying out attacks in which the expected collateral damage<sup>175</sup> “would be excessive in relation to the concrete and direct military advantage anticipated.”<sup>176</sup> The term “collateral damage” includes civilian casualties, so an attack that would result in a disproportionate number of civilian deaths to achieve a marginal military objective would violate the principle of proportionality and thus be unlawful.<sup>177</sup> Given its nature, proportionality is an extremely context-specific principle.<sup>178</sup> Even a small variation in the facts can change the legality of an attack.<sup>179</sup> Due to its context-dependency, the principle of proportionality creates an issue for the legality of attacks carried out by autonomous weapons.

Proportionality poses the problem of how to code an autonomous weapon to comply with the principle.<sup>180</sup> Theoretically, a robot could be programmed to meet this requirement in one of two ways.<sup>181</sup> The first is with an algorithm that can carry out a proportionality analysis, and the second is with an individual answer on how to respond to each of the seemingly countless situations that the weapon may encounter.<sup>182</sup> Using an algorithm is not yet a viable solution because currently no metric exists that can objectively measure excessive destruction.<sup>183</sup> As such, no computer system can adequately decipher whether an attack is proportionate.<sup>184</sup> Likewise, it is doubtful that programmers will be able to pre-program autonomous weapons with a specific response for each of the situations that arise during warfare.<sup>185</sup> On the other hand, humans are also fallible in assessing whether an attack would be proportional

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175. The expected collateral damage includes “loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof . . .” Additional Protocol 1, *supra* note 155, art. 51(5)(b).

176. *Id.*; UK MINISTRY OF DEF., *supra* note 3, at 24; Gillespie & West, *supra* note 155, at 12.

177. See Additional Protocol 1, *supra* note 155, art. 51(5)(b); Gillespie & West, *supra* note 155, at 12.

178. HUMAN RIGHTS WATCH, *supra* note 2, at 32.

179. *Id.*; see Cohen, *supra* note 101 (“The sudden presence of a school bus, for instance, may change a human soldier’s proportionality calculus, deterring him from engaging.”).

180. See HUMAN RIGHTS WATCH, *supra* note 2, at 32.

181. *Id.*

182. See *id.* at 28, 32.

183. *Grounds for Discrimination*, *supra* note 34, at 88.

184. *Id.*

185. HUMAN RIGHTS WATCH, *supra* note 2, at 32.

because no bright lines exist when each situation in warfare is different.<sup>186</sup> When faced with a disproportionate situation, therefore, a decision made by an autonomous weapon might be just as right or wrong as one made by a human.

Despite these difficulties, Anderson and Waxman argue that an autonomous weapon might comply with proportionality in the same way that it might comply with distinction.<sup>187</sup> Anderson and Waxman assert that

[s]ome systems might be capable of sufficient distinction and proportionality to be used only in environments likely to contain few or no civilians, or only for certain functions likely to pose little risk of damage to civilian property, or they would be intended for machine-on-machine operations, so that humans would not be an object of attack in any case.<sup>188</sup>

Thus, as technology progresses, autonomous weapons might comply with the principle of proportionality if utilized in limited situations with specific restrictions.

#### 4. Humanity

The last of the four principles of the Law of War is humanity.<sup>189</sup> The principle of humanity “forbids the infliction of suffering, injury, or destruction not actually necessary for the accomplishment of legitimate military purposes.”<sup>190</sup> Under humanity, combatants are required to cease any “further infliction of suffering” as soon as they have accomplished their military goals.<sup>191</sup> Out of the four Law of War principles, humanity arguably poses the least challenge for autonomous-weapon compliance.<sup>192</sup>

When analyzing whether an autonomous weapon will be able to comply with the humanity principle, the track record of the drone

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186. *See id.*; *Grounds for Discrimination*, *supra* note 34, at 88.

187. *See* ANDERSON & WAXMAN, *supra* note 14, at 13–14.

188. *Id.* at 13.

189. The principle of humanity is codified in Article 35(2) of Additional Protocol 1. Additional Protocol 1, *supra* note 155, art. 35(2).

190. UK MINISTRY OF DEF., *supra* note 3, at 23.

191. *Id.*

192. Benjamin Kastan, *Autonomous Weapons Systems: A Coming Legal “Singularity”?*, 2013 U. ILL. J.L. TECH & POL’Y 45, 62 (2013).

offers some guidance.<sup>193</sup> The drone currently offers many humane advantages that might be applicable to weapons of higher autonomy levels as well.<sup>194</sup> In analyzing the current use of drones, political scientist Avery Plaw compared the percentage of civilian deaths in Pakistan caused by the United States' C.I.A. drone program to the percentage of civilian deaths in past attacks utilizing more traditional weapons.<sup>195</sup> Out of the four studies that Plaw analyzed, the highest ratio of civilian victims to enemy combatants killed by drones in Pakistan was twenty percent.<sup>196</sup> In comparison, Plaw found that "[i]n conventional military conflicts over the last two decades . . . estimates of civilian deaths ranged from about [thirty-three] percent to more than [eighty] percent of all deaths."<sup>197</sup> Plaw concluded "[a] fair-minded evaluation of the best data we have available suggests that the drone program compares favorably with similar operations and contemporary armed conflict more generally."<sup>198</sup> Plaw's analysis, though recognizably limited,<sup>199</sup> suggests that the use of drones can comply with the humanity principle better than more traditional methods of warfare because drone use can result in fewer civilian deaths. Although this research was specifically on drones, the ultimate conclusion of fewer civilian deaths may be applicable to autonomous weapons as well. Subsequently, autonomous weapons might comply with the principle of humanity by providing an effective means of warfare that reduces the number of civilian casualties.

Even though it is not yet clear whether autonomous weapons can comply with military necessity, distinction, proportionality, and

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193. See generally *Automating Warfare*, *supra* note 21, at 140 (arguing that "[b]efore moving to autonomous operation we need to consider the lessons learned from the application of the current remotely piloted armed robots").

194. See Scott Shane, *The Moral Case for Drones*, N.Y. TIMES, July 14, 2012, [http://www.nytimes.com/2012/07/15/sunday-review/the-moral-case-for-drones.html?\\_r=0](http://www.nytimes.com/2012/07/15/sunday-review/the-moral-case-for-drones.html?_r=0) (noting that "some moral philosophers, political scientists and weapons specialists believe armed, unmanned aircraft offer marked moral advantages over almost any other tool of warfare").

195. *Id.*

196. *Id.*

197. *Id.*

198. *Id.*

199. *Id.* ("Plaw acknowledged the limitations of such comparisons, which mix different kinds of warfare.").



humanity, the converse has yet to be proven.<sup>200</sup> On the contrary, a combination of further technological advancement and regulations limiting use might result in compliance with the four principles. Nevertheless, even if an autonomous weapon can comply with the four principles, it must also still comply with applicable specific laws.<sup>201</sup> Whereas the four principles are broad standards that govern warfare actions in general,<sup>202</sup> there are also specific laws already in existence that might cover the legality of autonomous weapons, one of the most relevant being Article 36 of Additional Protocol 1 (“Article 36”).<sup>203</sup>

### B. Article 36

While no specific treaty exists governing the use of autonomous weapons,<sup>204</sup> many scholars argue that states developing autonomous weapons should assess such weapons pursuant to Article 36.<sup>205</sup> The text of Article 36 reads:

In the study, development, acquisition or adoption of a new weapon, or means or method of war, a High Contracting Party is under an obligation to determine whether its employment would, in some or all circumstances, be prohibited by this Protocol or by any other rule of international law applicable to the High Contracting Party.<sup>206</sup>

In other words, Article 36 requires that states party to Additional Protocol 1 review new weapons to see if they comply with the Law of War.<sup>207</sup>

One wrinkle on Article 36 is that many countries are not party to Additional Protocol 1, including the United States.<sup>208</sup> Nonetheless,

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200. See generally *UN Human Rights Expert*, *supra* note 6 (noting that autonomous weapons use “raises the question whether they can be programmed to comply with the requirements of [the Law of War],” but refraining from answering the question).

201. See generally *UK MINISTRY OF DEF.*, *supra* note 3, at 4, 21 (listing the different sources of the Law of War, and commenting that the four principles “underlie” the Law of War).

202. Stewart, *supra* note 31, at 272, 288.

203. See *HUMAN RIGHTS WATCH*, *supra* note 2, at 21–26. Article 51(4), 51(5)(b), and 32(2) of Additional Protocol 1 also apply to autonomous weapons, but are not specifically addressed by this Article because they codify the principles of distinction, proportionately, and humanity previously discussed. See Additional Protocol 1, *supra* note 155.

204. Marchant et al., *supra* note 9, at 289.

205. *HUMAN RIGHTS WATCH*, *supra* note 2, at 21; Stewart, *supra* note 31, at 283–84.

206. Additional Protocol 1, *supra* note 155, art. 36.

207. Stewart, *supra* note 31, at 283.

the United States still assesses new weaponry in accordance with Article 36.<sup>209</sup> In fact, the United States issued a Department of Defense Directive in 1974 that required new weaponry to undergo legal analysis, three years before Additional Protocol 1 was adopted.<sup>210</sup> Moreover, “[s]ome experts contend that Article 36 is customary international law binding on all states.”<sup>211</sup> It has still yet to be determined, however, whether Article 36 is customary international law and thus applicable to the United States in addition to the U.S. Department of Defense’s own directives.<sup>212</sup>

The intent behind Article 36 is for states to review weapons to ensure that their use is permissible under the Law of War.<sup>213</sup> To make this assessment, states initially must determine whether they are a party to any treaties prohibiting the use or existence of the new weapon.<sup>214</sup> In the case of autonomous weapons, no treaties currently ban their use or existence.<sup>215</sup> Next, states determine if the new weapon violates customary international law.<sup>216</sup> This step includes an analysis of whether the new weapon complies with the four principles of the Law of War.<sup>217</sup> As discussed in Part III.A, above, autonomous weapons do have the potential to comply with these four principles. Consequently, autonomous weapons may indeed pass an Article 36 analysis because no treaties currently prevent their use, and they do not inherently violate the four principles of the Law of War.

As demonstrated in Part III, above, the Law of War can be adapted to govern the use of autonomous weapons.<sup>218</sup> Furthermore, through appropriate restrictions (such as limiting use to only non-human targets), autonomous-weapon use may be adapted to comply with the Law of War. Thus, the use of autonomous weapons

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208. HUMAN RIGHTS WATCH, *supra* note 2, at 22.

209. *Id.*

210. See W. Hays Parks, *Conventional Weapons and Weapons Reviews*, 8 Y.B. OF INT’L HUMANITARIAN LAW 55, 109–112 (2005).

211. HUMAN RIGHTS WATCH, *supra* note 2, at 21.

212. Stewart, *supra* note 31, at 283.

213. HUMAN RIGHTS WATCH, *supra* note 2, at 24.

214. See *id.*

215. *Id.* (noting that “there is no existing treaty that prohibits them as a class”); Marchant et al., *supra* note 9, at 289, 298.

216. HUMAN RIGHTS WATCH, *supra* note 2, at 24.

217. See *id.*

218. See Stewart, *supra* note 31, at 272, 293.

can potentially be lawful under the Law of War, albeit in a limited capacity.

#### IV. REGULATION METHODS

To ensure compliance with the Law of War, autonomous-weapon use must be regulated.<sup>219</sup> There are two competing views on how to best regulate their use: (1) a complete ban on autonomous weapons,<sup>220</sup> or (2) regulations, including those already existing under customary international law, limiting the situations in which autonomous weapons can be used.<sup>221</sup> Proponents of an outright ban argue that autonomous weapons are unable to comply with the principle of distinction, and that this inability—coupled with accountability issues—necessitates a prohibition on both the advancement and utilization of autonomous weapons.<sup>222</sup> On the other side, proponents of regulations counter that a total ban limits the *actual* benefits of technology to evade *potential* instances of misuse and misconduct.<sup>223</sup> While both arguments have their merits, autonomous-weapon use should be regulated through strict regulations rather than an outright ban. By limiting autonomous-weapon use to only those situations where autonomous weapons can comply with the principle of distinction, regulations can both decrease the likelihood of Law of War violations and simultaneously clarify accountability issues.<sup>224</sup>

##### A. Ban on Autonomous Weapons

Should there be a complete ban on the use of autonomous weapons? The International Committee for Robot Arms Control

219. See *UN Human Rights Expert*, *supra* note 6.

220. HUMAN RIGHTS WATCH, *supra* note 2, at 2 (summarizing their conclusion “that fully autonomous weapons should be banned and that governments should urgently pursue that end”).

221. ANDERSON & WAXMAN, *supra* note 14, at 1, 20 (arguing that autonomous-weapon use should be regulated through the existing Law of War, as opposed to new treaties or a complete ban).

222. See HUMAN RIGHTS WATCH, *supra* note 2, at 46; *Grounds for Discrimination*, *supra* note 34, at 88–89; *Killer Robots*, *supra* note 4, at 66.

223. ANDERSON & WAXMAN, *supra* note 14, at 1; Schmitt & Thurnher, *supra* note 7, at 234, 281.

224. See generally Schmitt & Thurnher, *supra* note 7, at 278 (asserting that “the operator of an autonomous weapon system that cannot distinguish civilians from combatants who employs the system in an area where the two are intermingled has committed the war crime of indiscriminate attack”).

(ICRAC) would argue yes.<sup>225</sup> The ICRAC is “an international committee of experts in robotics technology, robot ethics, international relations, international security, arms control, international humanitarian law, human rights law, and public campaigns, concerned about the pressing dangers that military robots pose to peace and international security and to civilians in war.”<sup>226</sup> The group has succeeded in collecting over 270 signatures from computer experts,<sup>227</sup> originating from thirty-seven different nations, endorsing a statement that advocates for “a ban on the development and deployment of weapon systems that make the decision to apply violent force autonomously, without any human control.”<sup>228</sup>

One argument behind proposed bans is that autonomous weapons cannot comply with the principle of distinction.<sup>229</sup> As previously discussed, even though the use of autonomous weapons could be limited to circumstances all but ensuring discriminate attacks (such as only under water), there are currently no autonomous weapons that can distinguish whether an individual is a combatant or noncombatant.<sup>230</sup> Thus, while this Article argues that a ban is not the best regulation method, it is definitely a valid measure to ensure that autonomous-weapon use does not violate the Law of War.

A key question in creating a ban on autonomous weapons is which instrument to use to affect a ban. Although a new international treaty could ban the use of autonomous weapons, “international treaties . . . are only binding on states party to those treaties.”<sup>231</sup> As such, the proposed international ban would only be applicable to the states that agreed to be subject to it. An alternative solution would be amending the already existing Rome Statute to specifically define

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225. See *2014 Mission Statement*, INT’L COMMITTEE FOR ROBOT ARMS CONTROL, <http://icrac.net/statements/> (last visited Aug. 12, 2014).

226. *Who We Are*, INT’L COMMITTEE FOR ROBOT ARMS CONTROL, <http://icrac.net/who/> (last visited Feb. 20, 2014).

227. The 272 signatures are from “engineers, computing and artificial intelligence experts, roboticists, and professional from related disciplines,” and include the signatures of Geoffrey Hinton, Alan Bundy, and Lucy Suchman. Noel Sharkey, *Computing Experts from 37 Countries Call for Ban on Killer Robots*, INT’L COMMITTEE FOR ROBOT ARMS CONTROL (Oct. 16, 2013), <http://icrac.net/2013/10/computing-experts-from-37-countries-call-for-ban-on-killer-robots/> [hereinafter *37 Countries*].

228. *Id.*

229. See HUMAN RIGHTS WATCH, *supra* note 2, at 30–32.

230. See *supra* Part III.A.2.

231. UK MINISTRY OF DEF., *supra* note 3, at 4.

autonomous-weapon use as a war crime.<sup>232</sup> The Rome Statute, which has 122 state parties,<sup>233</sup> created the International Criminal Court (ICC), a court with “jurisdiction over genocide, war crimes, and crimes against humanity.”<sup>234</sup> Unfortunately, amendments to Article 8 of the Rome Statute—the Article listing war crimes—are not applicable to states that do not to accept them.<sup>235</sup> Thus, defining autonomous-weapon use as a war crime under the Rome Statute faces the same issue as creating a new treaty: not all states would be subject to its precepts.

In addition to the procedural issues, amending the Rome Statute to prohibit autonomous-weapon use might be considered redundant.<sup>236</sup> This argument has previously been made with respect to nuclear weapons.<sup>237</sup> The International Law and Policy Institute (ILPI), a proponent of banning nuclear weapons,<sup>238</sup> contends that banning nuclear weapons by amending the Rome Statute to define their use as a war crime would be redundant because the Rome Statute “already prohibits violations of the rule on distinction and the rule on proportionality.”<sup>239</sup> The ILPI further asserts that the

232. See generally *Nuclear Weapons and the International Criminal Court*, ILPI NUCLEAR WEAPONS PROJECT, <http://nwp.ilpi.org/?p=1480> (last visited Feb. 9, 2014) [hereinafter *Nuclear Weapons*] (arguing that amending the Rome Statute to define nuclear weapons use as a war crime is unnecessary).

233. *The States Parties to the Rome Statute*, INT’L CRIM. CT., [http://www.icc-cpi.int/en\\_menus/asp/states%20parties/Pages/the%20states%20parties%20to%20the%20rome%20statute.aspx](http://www.icc-cpi.int/en_menus/asp/states%20parties/Pages/the%20states%20parties%20to%20the%20rome%20statute.aspx) (last visited Feb. 16, 2014). It should be noted that

“[a]lthough the United States is not a party to the [Rome] Statute, the Obama administration has been prepared to support the court’s prosecutions . . . when it is in U.S. national interest to do so. Since November 2009, the United States has participated in an observer capacity in meetings of the I.C.C. Assembly of States Parties (ASP).”

*International Criminal Court*, U.S. DEP’T OF STATE, <http://www.state.gov/j/gcj/icc/> (last visited Feb. 16, 2014).

234. UK MINISTRY OF DEF., *supra* note 3, at 433.

235. Rome Statute of the International Criminal Court art. 121(5), July 17, 1988, 2187 U.N.T.S. 90 [hereinafter Rome Statute]; *Nuclear Weapons*, *supra* note 232.

236. See *Nuclear Weapons*, *supra* note 232.

237. See *id.*

238. *Towards the Elimination of Nuclear Weapons*, ILPI NUCLEAR WEAPONS PROJECT, [http://nwp.ilpi.org/?page\\_id=530](http://nwp.ilpi.org/?page_id=530) (last visited Feb. 9, 2014).

239. *Nuclear Weapons*, *supra* note 232. Article 8(2)(b)(iv) of the Rome Statute codifies the principle of proportionality. Rome Statute, *supra* note 235, art. 8(2)(b)(iv). Although the Rome Statute does not explicitly define indiscriminate attacks as war crimes, the International Criminal Tribunal for the Former Yugoslavia has stated that indiscriminate attacks “may qualify as direct attacks against civilians,” a violation of Article 8(2)(b)(i) of the Rome Statute. Prosecutor v. Galić, Case No. IT-98-29-T, Judgment and Opinion, ¶ 57 (Int’l Crim. Trib. for the Former Yugoslavia Dec. 5, 2003), available at <http://www.icty.org/x/cases/galic/tjug/en/gal-tj031205e>

arguments for amending the Rome Statute “miss the point . . . . [T]hey leave the impression that use of weapons of mass destruction would *not* be a war crime unless this is explicitly stated in the Statutes. This, of course, is wrong.”<sup>240</sup> Essentially, the ILPI argues that by prohibiting indiscriminate and disproportionate attacks, the Rome Statute effectively already bans nuclear-weapons use since nuclear-weapons use would inherently result in one of the proscribed attacks.<sup>241</sup> This same argument applies to autonomous weapons. Because autonomous weapons cannot distinguish combatants from noncombatants, the Rome Statute in essence already prohibits their use against human targets. However, the critical difference is that “[p]ractically all conceivable usages of . . . nuclear weapons[] would necessarily violate at least one” of the principles of distinction and proportionality,<sup>242</sup> whereas autonomous weapons might be able to comply with these two principles if limited to non-human targets. Thus, while the current Rome Statute arguably *bans* the use of nuclear weapons, it arguably only *restricts* the use of autonomous weapons.

#### *B. Regulations Limiting the Use of Autonomous Weapons*

Instead of a complete ban, states can potentially use regulations to limit the situations in which autonomous weapons might be utilized.<sup>243</sup> Regulations limiting use, when compared to a complete ban, provide the advantage of allowing technology to progress and the technology’s benefits to be recognized.<sup>244</sup> For example, the St. Petersburg Declaration of 1868 prohibited the use of exploding bullets in order to prevent excessive suffering.<sup>245</sup> The outright prohibition, however, was later softened through common practice among states.<sup>246</sup> The advantages of exploding bullets used against aircrafts were discovered during World War I.<sup>247</sup> Subsequently, Article 18 of the Hague Rules of Air Warfare (“Article 18”) was

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.pdf; Rome Statute, *supra* note 235, art. 8(2)(b)(i); HENCKAERTS & DOSWALD-BECK, *supra* note 15, at 589 (Rule 156); *see infra* Part V.B.2.b.

240. *Nuclear Weapons*, *supra* note 232.

241. *Id.*

242. *Id.*

243. *See* ANDERSON & WAXMAN, *supra* note 14, at 11, 20.

244. *See id.* at 1; Schmitt & Thurnher, *supra* note 7, at 234, 281.

245. HENCKAERTS & DOSWALD-BECK, *supra* note 15, at 272 (Rule 78).

246. *Id.* at 272–73.

247. *See id.*

written to recognize these advantages by changing the ban on exploding bullets to allow their use against aircrafts.<sup>248</sup> According to Article 18, the provision was to apply “equally to States which [were] parties to the Declaration of St. Petersburg, 1868, and to those which [were] not.”<sup>249</sup> Despite the Hague Rules of Air Warfare “never [being] adopted in legally binding form,”<sup>250</sup> the principle enunciated in Article 18 became the basis of customary international law.<sup>251</sup> Thus, the international community found a way to restrict the use of exploding bullets to comport with the Law of War, while still allowing states to take advantage of the technology’s benefits.

In the same way, regulations limiting the use of autonomous weapons have the potential to prevent such use from violating the Law of War.<sup>252</sup> The major scholarly debate over the use of autonomous weapons focuses on lethal decisions made by weapons unable to distinguish combatants from noncombatants.<sup>253</sup> A treaty that would limit the force exerted by autonomous weapons only to objects, not humans, might potentially resolve the issue. Instead of having to distinguish between humans, autonomous weapons would need to distinguish only between objects—a capability they already possess.<sup>254</sup> Indeed, the United States has already limited the use of autonomous weapon systems to non-human targets.<sup>255</sup> This solution would allow autonomous-weapon technology to advance, while at the same time, would reduce the chances of indiscriminate attacks.

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248. The Hague Rules of Air Warfare art. 18 December, 1922-February 1923 [hereinafter The Hague Rules of Air Warfare], available at [http://wwi.lib.byu.edu/index.php/The\\_Hague\\_Rules\\_of\\_Air\\_Warfare](http://wwi.lib.byu.edu/index.php/The_Hague_Rules_of_Air_Warfare); HENCKAERTS & DOSWALD-BECK, *supra* note 15, at 273 n.5 (Rule 78).

249. The Hague Rules of Air Warfare, *supra* note 248.

250. *Rules Concerning the Control of Wireless Telegraphy in Time of War and Air Warfare, Drafted by a Commission of Jurists at the Hague, December 1922–February 1923*, INT’L COMMITTEE OF THE RED CROSS, <http://www.icrc.org/ihl/INTRO/275?OpenDocument> (last visited Feb. 20, 2014).

251. Customary international law prohibits the use of exploding bullets against humans, but not aircrafts. HENCKAERTS & DOSWALD-BECK, *supra* note 15, at 272–73 (Rule 78) (recognizing as customary international law that “[t]he anti-personnel use of bullets which explode within the human body is prohibited”).

252. See generally ANDERSON & WAXMAN, *supra* note 14, at 11 (discussing how militaries will need to “identify[] where and under what legal limitations [autonomous-weapon] use would be lawful”).

253. See *Automating Warfare*, *supra* note 21, at 143; 37 *Countries*, *supra* note 227; *UN Human Rights Expert*, *supra* note 6.

254. See *supra* Part III.A.2.

255. DIRECTIVE 3000.09, *supra* note 5, at 3.

Once again, though, such regulations would apply only to the states that ratified the treaties articulating the regulations.<sup>256</sup>

In light of the procedural issues associated with creating new regulations, the best way to regulate autonomous-weapon use might instead be to enforce already existing customary international law.<sup>257</sup> Specifically, the principle of distinction mandates limitations on autonomous-weapon use.<sup>258</sup> Attacks involving weapons that “strike military objectives and civilians or civilian objects without distinction” are considered indiscriminate attacks<sup>259</sup>—attacks violating the principal of distinction.<sup>260</sup> Because the current technology does not enable autonomous weapons to distinguish combatants from noncombatants,<sup>261</sup> allowing an autonomous weapon to exert force against a human is arguably an indiscriminate attack and thereby a violation of the Law of War.<sup>262</sup> In contrast, as previously discussed in Part III.A.2, above, autonomous weapons can already tell the difference between objects, such as between hostile and friendly submarines.<sup>263</sup> Thus, while its use against human targets may violate the principle of distinction, autonomous-weapon use against non-human objects can potentially comply with the Law of War. Consequently, even without new regulations, the Law of War restricts the legal use of autonomous weapons to non-human targets.

Furthermore, existing treaties and statutes can already be interpreted to limit autonomous-weapon use,<sup>264</sup> particularly the Rome Statute.<sup>265</sup> The next section explores liability issues associated with autonomous weapons and grapples with the questions of who should be held civilly and criminally liable for an autonomous

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256. See UK MINISTRY OF DEF., *supra* note 3, at 4.

257. ANDERSON & WAXMAN, *supra* note 14, at 1, 27; Schmitt & Thurnher, *supra* note 7, at 279–280; Stewart, *supra* note 31, at 288–89, 293.

258. See *supra* Part III.A.2.

259. HENCKAERTS & DOSWALD-BECK, *supra* note 15, at 40 (Rule 12).

260. HUMAN RIGHTS WATCH, *supra* note 2, at 24.

261. *Automating Warfare*, *supra* note 21, at 143.

262. See generally HENCKAERTS & DOSWALD-BECK, *supra* note 15, at 37, 40 (Rule 12) (stating that indiscriminate attacks violate the Law of War and listing the general types of indiscriminate attacks).

263. See *supra* Part III.A.2.

264. See generally ANDERSON & WAXMAN, *supra* note 14, at 27 (arguing that “[e]xisting legal norms are sufficiently robust to enable us to address the new challenges raised by robotic systems”); HENCKAERTS & DOSWALD-BECK, *supra* note 15, at 37 (Rule 11) (discussing how Additional Protocol 1 prohibits indiscriminate attacks).

265. See *infra* Part V.B.2.b.



weapon's actions given the extent to which the Rome Statute prohibits indiscriminate attacks.

#### V. LIABILITY FOR THE FAILURES OF AUTONOMOUS WEAPONS

Civilian casualties are a tragic but inevitable part of armed conflict.<sup>266</sup> However, attacks resulting in civilian casualties are not necessarily unlawful. Civilian casualties resulting from a military attack in which the deaths are not “excessive in relation to the concrete and direct military advantage anticipated”<sup>267</sup> from the attack are generally considered collateral damage.<sup>268</sup> On the opposite side, attacks are unlawful when civilian deaths go beyond collateral damage,<sup>269</sup> such as with willful killings.<sup>270</sup> The Law of War has liability rules in place for when a human combatant makes an inappropriate decision on whether to deploy force in a given situation.<sup>271</sup> Autonomous weapons, on the other hand, present unique liability issues because they involve a robot, as opposed to a human, deciding whether to deploy force.<sup>272</sup> Consequently, “there is a strong argument” against states utilizing autonomous weapons until the liability issues have been worked out.<sup>273</sup> The question is: who will be liable for an autonomous weapon's actions? Ample scholarly debate places that responsibility on entities ranging from the programmer to the robot itself.<sup>274</sup> These entities can roughly be broken down into two categories: entities facing pecuniary accountability and entities facing criminal punishment. The following section discusses which entities might be held liable for an autonomous weapon's actions, and the feasibility of holding these entities responsible.

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266. See Bowden, *supra* note 1.

267. Additional Protocol 1, *supra* note 155, art. 51(5)(b).

268. See Gillespie, *supra* note 155, at 12.

269. See Additional Protocol 1, *supra* note 155, art. 51(5)(b).

270. See UK MINISTRY OF DEF., *supra* note 3, at 424.

271. See *id.* at 424–25.

272. UN Human Rights Expert, *supra* note 6; see *Killer Robots*, *supra* note 4, at 64, 66.

273. Stewart, *supra* note 31, at 291.

274. See HUMAN RIGHTS WATCH, *supra* note 2, at 42–45; Marchant et al., *supra* note 9, at 282–83; Schmitt & Thurnher, *supra* note 7, at 276–278; *Killer Robots*, *supra* note 4, at 69–73; Stewart, *supra* note 31, at 290–91.

*A. Pecuniary Accountability*

Three entities<sup>275</sup> might be held financially liable for an autonomous weapon's actions: the manufacturer, the programmer, and the state that utilizes the autonomous weapon. The manufacturer and programmer are subject to domestic tort law,<sup>276</sup> while the state is subject to the international Law of War and general principles of state responsibility.<sup>277</sup> Despite being subject to different laws, each actor, if liable, would be subject to forms of accountability other than criminal liability.<sup>278</sup>

*1. The Manufacturer*

Holding a manufacturer accountable for the failure of its product intuitively makes sense under theories of U.S. tort law. By employing the designers and selling the product, the manufacturer bears the responsibility for any harm its product causes. However, it is extremely difficult to hold the manufacturer of an autonomous weapon responsible.<sup>279</sup> The appropriate legal action to bring against an autonomous weapon manufacturer is a product liability lawsuit.<sup>280</sup> Because product liability lawsuits are civil lawsuits, two problems arise.<sup>281</sup>

The first problem is jurisdictional: the court must have jurisdiction over the manufacturer. Foreign jurisdiction over

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275. This Article excludes the operator and commander from the discussion on pecuniary liability due to the complexity of the doctrine of combat immunity. For a discussion on the doctrine of combat immunity, see *Smith v. Ministry of Defense*, [2013] UKSC 41, [85] (appeal taken from Eng. and Wales), <https://www.supremecourt.uk/cases/docs/uksc-2012-0249-judgment.pdf>.

276. See INT'L COMM. OF THE RED CROSS, REPORT OF THE ICRC EXPERT MEETING ON 'AUTONOMOUS WEAPONS SYSTEMS: TECHNICAL, MILITARY, LEGAL AND HUMANITARIAN ASPECTS', 26–28 MARCH 2014, GENEVA 2 (2014) [hereinafter REPORT OF THE ICRC]; HUMAN RIGHTS WATCH, *supra* note 2, at 43–44.

277. UK MINISTRY OF DEF., *supra* note 3, at 420.

278. HENCKAERTS & DOSWALD-BECK, *supra* note 15, at 537–38 (Rule 150); UK MINISTRY OF DEF., *supra* note 3, at 420; see HUMAN RIGHTS WATCH, *supra* note 2, at 43–44. This is based on the assumption that any Law of War violation caused by one of these actors was due to negligence as opposed to intentional misconduct. See HUMAN RIGHTS WATCH, *supra* note 2, at 43–44. Although it is possible that a programmer might intentionally miscode an autonomous weapon in order to have the weapon carry out a Law of War violation, intentional acts exceed the scope of this discussion. See Schmitt & Thurnher, *supra* note 7, at 277.

279. See HUMAN RIGHTS WATCH, *supra* note 2, at 44.

280. See REPORT OF THE ICRC, *supra* note 276, at 2; HUMAN RIGHTS WATCH, *supra* note 2, at 44.

281. See HUMAN RIGHTS WATCH, *supra* note 2, at 44.

manufacturers is a murky area of law.<sup>282</sup> Consider, for example, if another nation used an autonomous weapon, manufactured in that nation, as to injure United States citizens on United States soil. If the United States citizens wanted to sue the weapon's manufacturer in a United States court, they would first need to ensure that the United States court had jurisdiction over the foreign manufacturer. The test for whether a United States court has jurisdiction over a foreign manufacturer was created in *J. McIntyre Machinery, Ltd. v. Nicastro*.<sup>283</sup> In *McIntyre*, a plurality of the United States Supreme Court held that the state of New Jersey did not have jurisdiction over a British manufacturing company for injuries occurring in New Jersey caused by the company's product, because the company did not "engage in any activities in New Jersey that reveal an intent to invoke or benefit from the protections of its laws."<sup>284</sup> The mere fact that the ruling was a plurality and not a majority opinion suggests a lack of clarity regarding U.S. courts' jurisdiction over foreign companies. Additionally, the plurality holding begs a number of questions when applied to autonomous-weapons manufacturers. Would an autonomous-weapons manufacturer intend to be protected by the laws of the country in which its weapons are deployed? Would the manufacturer know in which countries its weapons are being deployed? Based on the existing legal framework, it is not clear whether the civilian victims of an autonomous-weapon attack would be able to bring suit against autonomous-weapon manufacturers in their home nations.

Even if civilian victims of an autonomous-weapon attack chose to side-step jurisdictional problems by suing the manufacturer in the manufacturer's local courts, the potential costs of that foreign litigation raise additional concern.<sup>285</sup> According to Human Rights Watch, a human rights advocacy group, "[i]t is unrealistic to expect civilian victims of war, who are often poverty stricken and geographically displaced by conflict, to sue for relief against a

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282. See generally *J. McIntyre Machinery, Ltd. v. Nicastro*, 131 S. Ct. 2780, 2790–91 (2011) (holding that a New Jersey court did not have jurisdiction over a foreign manufacturer, but concurrence discusses situations in which there could be jurisdiction over foreign manufacturers).

283. 131 S. Ct. 2780 (2011).

284. *Id.* at 2791.

285. HUMAN RIGHTS WATCH, *supra* note 2, at 44.

manufacturer in a foreign court.”<sup>286</sup> Thus, while the option to sue the manufacturer does exist, these jurisdictional issues place a heavy burden on civilian victims to either bring a lawsuit in their home nation under an unclear area of law, or travel to a foreign nation and bring suit under foreign laws.

The second problem stemming from product liability actions as civil suits is that they are governed by domestic law.<sup>287</sup> Through domestic law, a nation-state can severely limit the circumstances under which a manufacturer may be held liable for weapon failures.<sup>288</sup> In the United States, for example, the United States Supreme Court held in *Boyle v. United Technologies Corp.* that if certain requirements are met, “liability for design defects in military equipment cannot be imposed, pursuant to state law,” on independent contractors who supply the United States government with military equipment.<sup>289</sup> Specifically, the Supreme Court held that such liability is not appropriate when: “(1) the United States approved reasonably precise specifications; (2) the equipment conformed to those specifications; and (3) the supplier warned the United States about the dangers in the use of the equipment that were known to the supplier but not to the United States.”<sup>290</sup> Although the Court’s holding is domestic law and therefore not applicable on the international level, the Court’s opinion is a perfect example of how domestic law can severely limit the situations in which the manufacturer of an autonomous weapon may be held liable for the weapon’s actions.<sup>291</sup> Consequently, even though individuals can attempt to bring a lawsuit against autonomous-weapon manufacturers, the limitations of product liability lawsuits pose great

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286. *Id.* Although the example in the preceding paragraph referred to United States citizens, the analysis is meant to apply to citizens of all nations. Jurisdiction over foreign manufacturers will vary from nation to nation depending on their domestic law. The jurisdiction laws of the United States are meant to serve as an example of the difficulties in bringing civil suits against foreign manufacturers.

287. See REPORT OF THE ICRC, *supra* note 276, at 2 (listing different types of lawsuits and specifying which ones involve international law).

288. See *Boyle v. United Techs. Corp.*, 487 U.S. 500, 512 (1988).

289. *Id.*

290. *Id.*

291. For an example of the *Boyle* holding applied to the manufacturers of a computerized weapon system, see *Koohi v. U.S.*, 976 F.2d 1328 (9th Cir. 1992) (holding that a lawsuit against the companies that manufactured the Aegis Air Defense System was “preempted by federal law”).

difficulty in subjecting an autonomous-weapon manufacturer to liability for an autonomous weapon's actions.<sup>292</sup>

## 2. The Programmer

The programmer of an autonomous weapon also might be held accountable for the weapon's failure to comply with the Law of War. Typically, when a computerized machine makes a mistake, it is seen as a technical error.<sup>293</sup> This characterization directs the blame at the programmer.<sup>294</sup> Scholars argue whether a programmer could be held liable for writing code for an autonomous weapon that does not comply with the Law of War.<sup>295</sup> For example, if a programmer does not encode a robot to adequately discriminate between legal and non-legal targets, and the robot then attacks a non-legal target, the programmer might be held liable for the indiscriminate attack.<sup>296</sup> However, the jurisdictional problems with holding manufacturers accountable, as discussed in the previous section, also apply to programmers.<sup>297</sup>

Another problem with holding an autonomous weapon's programmer responsible for the weapon's actions is the number of programmers involved in the code writing process. Autonomous weapons comprise of "millions of lines of code . . . written by teams of programmers."<sup>298</sup> Because no one person "knows the entire program . . . no individual can predict the effect of a given command with absolute certainty."<sup>299</sup> This lack of knowledge makes the programmer (or programming team) a problematic entity to hold responsible.

## 3. The State

The state that utilizes an autonomous weapon is an appropriate entity to hold responsible for the weapon's actions.<sup>300</sup> In fact, Article 91 of Additional Protocol 1 provides that "[a] Party to the conflict

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292. HUMAN RIGHTS WATCH, *supra* note 2, at 44.

293. *See id.* at 43.

294. *Id.*

295. *See* Marchant et al., *supra* note 9, at 282–83.

296. *See id.* at 282.

297. *See generally* REPORT OF THE ICRC, *supra* note 276, at 2 (out of the four legal regimes listed, the only one applicable to programmers acting unintentionally is product liability).

298. Marchant et al., *supra* note 9, at 284.

299. *Id.*

300. ANDERSON & WAXMAN, *supra* note 14, at 17.

which violates the provisions of the Conventions or of this Protocol shall, if the case demands, be liable to pay compensation.”<sup>301</sup> Additionally, customary international law provides that “[a] State responsible for violations of [the Law of War] is required to make full reparation for the loss or injury caused.”<sup>302</sup> Moreover, the principle of state responsibility mandates such reparations.<sup>303</sup> Thus, if an autonomous weapon carries out an indiscriminate or disproportionate attack, the state that deployed the weapon should be held legally responsible and make full reparations. To avoid this result, Anderson and Waxman suggest that state “operational planning . . . includ[e] legal reviews of weapon systems and justification of their use in particular operational conditions.”<sup>304</sup> Furthermore, states should require that autonomous-weapon operators undergo training to ensure that operators know the strengths and weaknesses of autonomous weapons—specifically any shortcomings of the weapon that could potentially cause Law of War violations.<sup>305</sup>

Although a state is an appropriate entity to hold responsible for an autonomous weapon’s actions, holding a state solely responsible is problematic because reparation may not be seen as a harsh enough punishment.<sup>306</sup> Failure in the past to address the retributive need for stricter punishment has led to serious consequences.<sup>307</sup> For example, on May 22, 2013, two men murdered—and almost beheaded—a British soldier.<sup>308</sup> Michael Adebolajo, one of the convicted murderers, stated “[t]he only reason we’ve killed this man today is because Muslims are dying daily by British soldiers.”<sup>309</sup> Another

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301. Additional Protocol 1, *supra* note 155, art. 91.

302. HENCKAERTS & DOSWALD-BECK, *supra* note 15, at 537 (Rule 150).

303. DRAFT ARTICLES ON RESPONSIBILITY OF STATES FOR INTERNATIONALLY WRONGFUL ACTS, WITH COMMENTARIES 32, 91 (2001), available at [http://legal.un.org/ilc/texts/instruments/english/commentaries/9\\_6\\_2001.pdf](http://legal.un.org/ilc/texts/instruments/english/commentaries/9_6_2001.pdf).

304. ANDERSON & WAXMAN, *supra* note 14, at 17.

305. See generally DIRECTIVE 3000.09, *supra* note 5, at 3, 7–8 (requiring “[a]dequate training . . . [for] system operators and commanders to understand the functioning, capabilities, and limitations of the system’s autonomy in realistic operational conditions”).

306. See Bowden, *supra* note 1.

307. See *id.*

308. 2 Muslim Radicals—‘Soldiers of Allah’—Convicted in Brutal Murder of British Soldier, FOX NEWS (Dec. 19, 2013), <http://www.foxnews.com/world/2013/12/19/jury-finds-2-men-guilty-murder-in-brutal-attack-on-british-soldier/>.

309. *Id.* (quoting Michael Adebolajo).

example is the Boston Marathon bombing.<sup>310</sup> Dzhokhar Tsarnaev, the accused bomber, wrote a note essentially justifying the bombings as “retribution for the US [sic] crimes against Muslims in places like Iraq and Afghanistan.”<sup>311</sup> These acts of terrorism illustrate that harsher punishment is needed for unlawful acts carried out by autonomous weapons: criminal punishment.

### B. Criminal Punishment

A much trickier question than asking who can be held financially accountable is who should be held criminally liable for an autonomous weapon’s actions. This question has been asked and scrutinized by numerous scholars.<sup>312</sup> When analyzing this question, however, scholars often skip over a vital step in the analysis: whether a robot can commit a war crime. By limiting the scope of their analysis through questions such as “who should be held responsible if an AWS [autonomous weapon system] was involved in a wartime atrocity of the sort that would normally be described as a war crime,”<sup>313</sup> scholars start off by side-stepping the issue of whether a robot can commit a war crime, and proceed from there.<sup>314</sup> The fatal flaw in this type of analysis is that it fails to address one of the seminal issues regarding accountability for an autonomous weapon’s actions: a robot is fundamentally unable to commit a war crime. The real liability issue then becomes who, if anyone, should be held criminally liable when the *use* of an autonomous weapon fails to comply with the Law of War.<sup>315</sup>

#### 1. War Crimes

“Serious violations of the [Law of War]”<sup>316</sup> are known as war crimes.<sup>317</sup> War crimes are procedurally prosecuted in one of three

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310. Bowden, *supra* note 1.

311. *Boston Bombings Revenge Against US: Tsarnaev*, SYDNEY MORNING HERALD (May 17, 2013), <http://www.smh.com.au/world/boston-bombings-revenge-against-us-tsarnaev-20130517-2jpv0.html> (quoting John Miller, a CBS News reporter) (internal quotation marks omitted).

312. See HUMAN RIGHTS WATCH, *supra* note 2, at 42–45; Schmitt & Thurnher, *supra* note 7, at 276–78; *Killer Robots*, *supra* note 4, at 69–73; Stewart, *supra* note 31, at 290–91.

313. *Killer Robots*, *supra* note 4, at 66.

314. See HUMAN RIGHTS WATCH, *supra* note 2, at 42–45; *Killer Robots*, *supra* note 4, at 66, 69–73.

315. See Schmitt & Thurnher, *supra* note 7, at 277–78.

316. UK MINISTRY OF DEF., *supra* note 3, at 427.

317. Rome Statute, *supra* note 235, art. 8; HENCKAERTS & DOSWALD-BECK, *supra* note 15, at 568; UK MINISTRY OF DEF., *supra* note 3, at 427.

court systems.<sup>318</sup> The first is a domestic court system.<sup>319</sup> According to the Law of War, “[a] state may elect to deal with its own nationals under the appropriate municipal law for acts that amount to war crimes.”<sup>320</sup> Additionally, “[i]nternational law permits any state to try those accused of war crimes, whatever their nationality and wherever the offence was committed . . . [as long as] the particular crime or the particular offender can be tried according to the domestic law of the state concerned.”<sup>321</sup> Second, international tribunals can prosecute war crime perpetrators.<sup>322</sup> However, international tribunals’ statutes and case law “have no legal binding authority outside their respective geographical locations.”<sup>323</sup> A third and newer court system in which to try war crimes is the International Criminal Court (ICC).<sup>324</sup> The ICC was created under the Rome Statute, which “came into force on July 1, 2002.”<sup>325</sup> The court has “jurisdiction over genocide, war crimes, and crimes against humanity.”<sup>326</sup> Yet, the court has “jurisdiction only where states having jurisdiction themselves are ‘unwilling or unable genuinely’ to exercise that jurisdiction.”<sup>327</sup> Accordingly, the ICC does not override states’ domestic jurisdictions.<sup>328</sup> Due to the breadth of the ICC’s jurisdiction and its uniform application of the Law of War, this Article is primarily focused on war crimes punishable in the ICC under the Rome Statute.

The Rome Statute differs from the United States Model Penal Code in defining the requisite mens rea of a crime. While the United States Model Penal Code identifies four different types of mens rea (purposely, knowingly, recklessly, and negligently),<sup>329</sup> the Rome Statute consists of a blanket statement.<sup>330</sup> Article 30 of the Rome Statute states: “Unless otherwise provided, a person shall be

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318. UK MINISTRY OF DEF., *supra* note 3, at 427–33.

319. *Id.* at 427, 429.

320. *Id.* at 427.

321. *Id.* at 429.

322. *Id.* at 431.

323. Michael L. Smidt, *Yamashita, Medina, and Beyond: Command Responsibility in Contemporary Military Operations*, 164 MIL. L. REV. 155, 206 (2000).

324. UK MINISTRY OF DEF., *supra* note 3, at 433.

325. *Id.*

326. *Id.*

327. *Id.*

328. *Id.*

329. MODEL PENAL CODE § 2.02 (2013).

330. *See* Rome Statute, *supra* note 235, art. 30.



criminally responsible and liable for punishment for a war crime within the jurisdiction of the Court only if the material elements are committed with intent and knowledge.”<sup>331</sup>

Article 30 provides two ways for perpetrators to have intent.<sup>332</sup> First, a perpetrator can have intent “[i]n relation to conduct, [if] that person means to engage in the conduct.”<sup>333</sup> For example, perpetrators have the intent to commit a willful killing if they mean to kill “one or more persons . . . protected under one or more of the Geneva Conventions of 1949.”<sup>334</sup> Second, a perpetrator can have intent “[i]n relation to a consequence, [if] that person means to cause that consequence or is aware that it will occur in the ordinary course of events.”<sup>335</sup> For example, perpetrators have the intent to commit the “[w]ar crime of wilfully [sic] causing great suffering” if they are aware that their actions will cause “great physical or mental pain or suffering to, or serious injury to body or health of, one or more persons . . . protected under one or more of the Geneva Conventions of 1949.”<sup>336</sup>

Article 30 defines “knowledge” as an “awareness that a circumstance exists or a consequence will occur in the ordinary course of events.”<sup>337</sup> Applying this to the last example, a person has knowledge that they are committing the “[w]ar crime of wilfully [sic] causing great suffering” if they are aware that their actions will ordinarily result in such suffering.<sup>338</sup> In summary, for the ICC to find a perpetrator guilty of a war crime, not only must the perpetrator commit the requisite act, but he or she must also commit the act with the requisite intent and knowledge.<sup>339</sup>

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331. *Id.*

332. *Id.*

333. *Id.*

334. See ASSEMBLY OF STATES PARTIES TO THE ROME STATUTE OF THE INT’L CRIMINAL COURT, ELEMENTS OF CRIMES 1, 13 (2011) [hereinafter ELEMENTS OF CRIMES].

335. Rome Statute, *supra* note 235, art. 30.

336. See ELEMENTS OF CRIMES, *supra* note 334, at 1, 15.

337. Rome Statute, *supra* note 235, art. 30.

338. See ELEMENTS OF CRIMES, *supra* note 334, at 1, 15.

339. Rome Statute, *supra* note 235, art. 30; ELEMENTS OF CRIMES, *supra* note 334, at 1.

## 2. Potential Entities to Hold Criminally Liable

Who, then, should be held criminally liable when the use of an autonomous weapon violates the Law of War? Three entities<sup>340</sup> that have been suggested are the robot itself, the combatant who deployed the weapon, and the commander.<sup>341</sup> However, as will be shown, the robot is not an appropriate entity to hold criminally liable for its own actions because a robot cannot commit a war crime.

### *a. The Robot*

A robot cannot commit a war crime by definition, and thus cannot be criminally liable for its actions. Although some scholars suggest that a robot could potentially be held criminally liable,<sup>342</sup> the bottom line is that unless a war crime is committed, there can be no criminal liability. Article 30 of the Rome Statute requires a person to have the appropriate mental state in order to be found liable for a war crime.<sup>343</sup> This poses two problems for holding a robot criminally liable. First, and most obvious, a robot is not a “person.” Second, a robot cannot have the requisite intent and knowledge that Article 30 mandates. As discussed in Part II.A, above, rather than actually thinking, robots merely simulate human thinking and thus, do not truly understand the meaning behind their programmed behavior.<sup>344</sup> Consequently, robots are not capable of performing actions with the requisite intent and knowledge mandated by Article 30.

Because an autonomous weapon is not capable of committing a war crime, the question is not who should be held responsible for an autonomous weapon’s war crimes, but rather: who should be held accountable when the *use* of an autonomous weapon fails to comply

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340. Because this article is primarily focused on war crimes punishable by the ICC under the Rome Statute, it does not analyze the potential criminal liability of the manufacturer and programmer. While both could potentially be held criminally liable for negligent crimes, the Rome Statute requires the majority of crimes within the ICC’s jurisdiction to be committed with the mens rea of intent and knowledge. *See* Rome Statute, *supra* note 235, art. 30.

341. HUMAN RIGHTS WATCH, *supra* note 2, at 42–45; Schmitt & Thurnher, *supra* note 7, at 277–78; *Killer Robots*, *supra* note 4, at 69–73; Michael Aaronson, *Robots Don’t Kill People, It’s the Humans We Should Worry About*, THE CONVERSATION (May 31, 2013, 6:49 AM), <https://theconversation.com/robots-dont-kill-people-its-the-humans-we-should-worry-about-14779>.

342. HUMAN RIGHTS WATCH, *supra* note 2, at 45; *see Killer Robots*, *supra* note 4, at 71–73.

343. Rome Statute, *supra* note 235, art. 30.

344. Searle, *supra* note 63, at 422; *see* Solum, *supra* note 63, at 1236–37 (summarizing Searle’s conclusions).

with the Law of War.<sup>345</sup> Specifically, who should be held accountable when an autonomous weapon, even if working correctly, is placed in circumstances where it is incapable of complying with the Law of War?<sup>346</sup>

*b. The Operator*

The combatant who deploys an autonomous weapon is an appropriate entity to hold criminally liable for the robot's actions if certain conditions are met.<sup>347</sup> For simplicity, the remainder of this Article will refer to such combatant as "the operator." The operator is the person who ultimately decides whether to utilize an autonomous weapon under the circumstances.<sup>348</sup> Accordingly, when analyzing whether to hold an operator liable for an autonomous weapon's actions, it is the operator's decision that must face legal scrutiny.<sup>349</sup> The operator is capable of making decisions using both knowledge and intent, and therefore is capable of committing a war crime.<sup>350</sup> One potential war crime that an autonomous-weapon operator might be held liable for is an indiscriminate attack.<sup>351</sup>

"[L]aunching an indiscriminate attack resulting in loss of life or injury to civilians or damage to civilian objects" is a war crime; therefore, combatants carrying out such indiscriminate attacks face criminal liability.<sup>352</sup> The Rome Statute does not expressly define indiscriminate attacks as war crimes.<sup>353</sup> However, both the International Court of Justice (ICJ)<sup>354</sup> and the International Criminal

345. See Schmitt & Thurnher, *supra* note 7, at 278; Aaronson, *supra* note 341.

346. See Schmitt & Thurnher, *supra* note 7, at 278.

347. *Id.* at 277–78, 280; Aaronson, *supra* note 341.

348. See Schmitt & Thurnher, *supra* note 7, at 278; Aaronson, *supra* note 341 (describing an operator as the person who deploys an autonomous weapon).

349. Schmitt & Thurnher, *supra* note 7, at 277–78, 280; see Aaronson, *supra* note 341 (asserting that if an autonomous weapon is "operated in a way that breaches the law, there is a clear mechanism for holding those responsible to account").

350. See Schmitt & Thurnher, *supra* note 7, at 277–78, 280; Aaronson, *supra* note 341; see generally Rome Statute, *supra* note 235, art. 30 (stating that war crimes under the Rome Statute must be "committed with intent and knowledge").

351. Schmitt & Thurnher, *supra* note 7, at 278.

352. HENCKAERTS & DOSWALD-BECK, *supra* note 15, at 586 (Rule 156) (stating that despite the Rome Statute not referring to certain crimes, including indiscriminate attacks, as war crimes, "they are criminal either by virtue of the fact that such acts in practice amount to one or more of the crimes listed in the Statute, or because they are violations of customary international law, the criminal nature of which has been recognized by the international community").

353. *Id.* at 586, 589.

354. The International Court of Justice "settle[s], in accordance with international law, legal disputes submitted to it by States and . . . give[s] advisory opinions on legal questions referred to

Tribunal for the Former Yugoslavia (ICTY) have insinuated that “an indiscriminate attack amounts in practice to an attack on civilians,”<sup>355</sup> a war crime under the Rome statute.<sup>356</sup> Although neither ICJ nor ICTY opinions are binding precedent on the ICC, they serve as strong, persuasive authority.<sup>357</sup> In the *Legality of the Threat or Use of Nuclear Weapons* case<sup>358</sup> Advisory Opinion, the ICJ stated, “[s]tates must never make civilians the object of attack and must consequently never use weapons that are incapable of distinguishing between civilian and military targets.”<sup>359</sup> Essentially, the ICJ asserted that using indiscriminate weapons is tantamount to attacking civilians due to the likely consequences.<sup>360</sup> Similarly, the ICTY stated in the *Prosecutor v. Galić* case,<sup>361</sup> “indiscriminate attacks, that is to say, attacks which strike civilians or civilian objects and military objectives without distinction, may qualify as direct attacks against civilians.”<sup>362</sup> Accordingly, if the ICC chooses to follow the persuasive authority of the ICJ and the ICTY, an indiscriminate attack will equate to a war crime punishable by the ICC, even though it is not expressly defined as one in the Rome Statute.<sup>363</sup>

Allowing autonomous weapons to use force against human targets can potentially equate to the “[w]ar crime of attacking civilians” under the Rome Statute.<sup>364</sup> Since the current technology does not enable autonomous weapons to distinguish between combatants and noncombatants, using autonomous weapons against

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it by authorized United Nations organs and specialized agencies.” *The Court*, INT’L CT. JUST., <http://www.icj-cij.org/court/index.php?p1=1> (last visited Feb. 16, 2014).

355. HENCKAERTS & DOSWALD-BECK, *supra* note 15, at 589 (Rule 156).

356. Rome Statute, *supra* note 235, art. 8(2)(b)(i); ELEMENTS OF CRIMES, *supra* note 334, at 18.

357. *See generally* Rome Statute, *supra* note 235, art. 21 (listing the sources of legal authority to be employed by the ICC).

358. Advisory Opinion, 1996 I.C.J. 226 (July 8).

359. *Id.* at 257.

360. *See* HENCKAERTS & DOSWALD-BECK, *supra* note 15, at 589 (Rule 156).

361. *Prosecutor v. Galić*, Case No. IT-98-29-T, Judgment and Opinion (Int’l Crim. Trib. for the Former Yugoslavia Dec. 5, 2003), available at <http://www.icty.org/x/cases/galic/tjug/en/gal-tj031205e.pdf>.

362. *Id.* at ¶ 57; HENCKAERTS & DOSWALD-BECK, *supra* note 15, at 589 n.105 (Rule 156).

363. *See* HENCKAERTS & DOSWALD-BECK, *supra* note 15, at 589 (Rule 156).

364. ELEMENTS OF CRIMES, *supra* note 334, at 18; *see generally* HENCKAERTS & DOSWALD-BECK, *supra* note 15, at 589 (Rule 156) (asserting that “an indiscriminate attack amounts in practice to an attack on civilians”).

human targets might be considered an indiscriminate attack.<sup>365</sup> Furthermore, under the reasoning of the ICJ and ICTY, indiscriminate attacks are tantamount to attacking civilians.<sup>366</sup> Thus, if the ICC adopts the reasoning of the ICJ and ICTY, then autonomous-weapon use against human targets might qualify as attacking civilians, a war crime punishable under the Rome Statute.

Article 8(2)(b)(i) of the Rome Statute makes it a war crime to “[i]ntentionally [direct] attacks against the civilian population as such or against individual civilians not taking direct part in hostilities.”<sup>367</sup> This war crime, known as the “[w]ar crime of attacking civilians” has five elements:

1. The perpetrator directed an attack.
2. The object of the attack was a civilian population as such or individual civilians not taking direct part in hostilities.
3. The perpetrator intended the civilian population as such or individual civilians not taking direct part in hostilities to be the object of the attack.
4. The conduct took place in the context of and was associated with an international armed conflict.
5. The perpetrator was aware of factual circumstances that established the existence of an armed conflict.<sup>368</sup>

As applied to autonomous-weapons use, the two hardest elements to prove are generally the second and the third.

The second element requires the prosecutor to prove that the attack was aimed at civilians.<sup>369</sup> The ICTY analyzed a similar element under a different statute in the *Prosecutor v. Blaškić* case.<sup>370</sup> In *Blaškić*, the perpetrators used bombs with “‘irregular’ and non-linear” trajectories, making the bombs “likely to hit non-military targets.”<sup>371</sup> Consequently, “[t]he Trial Chamber inferred from the arms used that the perpetrators of the attack had wanted to affect

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365. See *supra* Part IV.B.

366. HENCKAERTS & DOSWALD-BECK, *supra* note 15, at 589 (Rule 156).

367. Rome Statute, *supra* note 235, art. 8(2)(b)(i).

368. ELEMENTS OF CRIMES, *supra* note 334, at 18.

369. *Id.*

370. *Prosecutor v. Blaškić*, Case No. IT-95-14-T, Judgment, ¶ 512 (Int’l Crim. Trib. for the Former Yugoslavia Mar. 3, 2000), available at <http://www.icty.org/x/cases/blaskic/tjug/en/bla-tj000303e.pdf>.

371. *Id.*

Muslim civilians.”<sup>372</sup> Thus, according to the ICTY, the features and accuracy of a weapon can be used to determine if an attack was aimed at civilians.<sup>373</sup> Once again, although the ICTY’s opinions are not binding, they are strong, persuasive authority.<sup>374</sup>

Likewise, because autonomous weapons cannot tell the difference between combatants and noncombatants, an autonomous weapon allowed to target humans will likely attack civilians.<sup>375</sup> Under the ICTY’s reasoning, then, the use of an autonomous weapon against human targets might equate to an attack aimed at civilians. Therefore, if the ICC follows the ICTY’s reasoning, a prosecutor can potentially prove the second element under Article 8(2)(b)(i)—that the perpetrator aimed the attack at civilians<sup>376</sup>—through evidence of the weapon’s inability to distinguish between combatants and noncombatants.

The remaining problematic element that a prosecutor must prove to establish the “[w]ar crime of attacking civilians”<sup>377</sup> is the mental requirement. The general intent and knowledge requirements defined in Article 30 must be met.<sup>378</sup> Specifically, the prosecutor must prove that the perpetrator had intent by proving that the perpetrator “mean[t] to engage in the conduct,” and that the perpetrator had knowledge by proving that the perpetrator was aware of the circumstances existing at the time of the attack.<sup>379</sup> Thus, the prosecutor must establish that the operator meant to direct the autonomous-weapon attack at civilians, and that the operator was also aware that the autonomous weapon would target civilians.

In proving that the operator had the requisite intent, the ICTY’s analysis in the *Blaškić* case can once again serve as a persuasive guideline. The *Blaškić* Trial Chamber reasoned “that the perpetrators of the attack had wanted to affect” the civilian population, due to the fact that the inaccuracy of the weapons used made them “likely to hit

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372. *Id.*

373. *See id.*; Prosecutor v. Galić, Case No. IT-98-29-T, Judgment and Opinion, ¶ 57 n.101 (Int’l Crim. Trib. for the Former Yugoslavia Dec. 5, 2003), available at <http://www.icty.org/x/cases/galic/tjug/en/gal-tj031205e.pdf>.

374. *See generally* Rome Statute, *supra* note 235, art. 21 (listing the sources of legal authority to be employed by the ICC).

375. *See Automating Warfare*, *supra* note 21, at 143–44.

376. ELEMENTS OF CRIMES, *supra* note 334, at 18.

377. *Id.*

378. *See* Rome Statute, *supra* note 235, art. 30; ELEMENTS OF CRIMES, *supra* note 334, at 1.

379. Rome Statute, *supra* note 235, art. 30.

non-military targets.”<sup>380</sup> Thus, the ICTY suggests that choosing to use weapons under circumstances where such use cannot comply with the principle of distinction (regarding humans) shows intent to attack civilians.<sup>381</sup> Incorporating this idea into the language of the Rome Statute, the operator’s choice to use a weapon incapable of distinguishing between combatants and noncombatants might be construed as the operator *meaning to* “direct[] [an] attack[] against the civilian population as such.”<sup>382</sup>

In addition to intent, the prosecutor must also prove that the perpetrator had the requisite knowledge by showing that the operator was aware that the autonomous weapon would target civilians. This knowledge requirement might be met by showing a series of inferential steps. The prosecutor would have to prove (1) that the operator was aware of the autonomous weapon’s inability to distinguish between combatants and noncombatants, and (2) that despite this knowledge, the operator used the autonomous weapon against human targets (3) in an area that the operator knew contained a disproportionate number of civilians.<sup>383</sup> By proving all three facts, a prosecutor might be able to prove that the operator was aware that the autonomous weapon would target civilians, and subsequently, that the operator carried out the act with the requisite knowledge.

Thus, a prosecutor can potentially prove the mental element of the “[w]ar crime of attacking civilians”<sup>384</sup> if the ICC chooses to follow the ICTY’s reasoning process. The big question then is whether or not the ICC will adopt the ICJ and ICTY’s analysis. If it does, then the use of autonomous weapons against human targets might equate to a war crime under the existing Rome Statute.<sup>385</sup> Additionally, if the ICC does rule that autonomous-weapon use against human targets rises to the level of a war crime, the ruling

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380. Prosecutor v. Blaškić, Case No. IT-95-14-T, Judgment, ¶ 512 (Int’l Crim. Trib. for the Former Yugoslavia Mar. 3, 2000), available at <http://www.icty.org/x/cases/blaskic/tjug/en/bla-tj000303e.pdf>.

381. See *id.*

382. Rome Statute, *supra* note 235, art. 8(2)(b)(i).

383. A prosecutor must prove that the perpetrator knew that a disproportionate number of civilians were present in order to overcome the argument that the perpetrator believed the civilian casualties were collateral damage. See HENCKAERTS & DOSWALD-BECK, *supra* note 15, at 589–90 (Rule 156).

384. ELEMENTS OF CRIMES, *supra* note 334, at 18.

385. See generally HENCKAERTS & DOSWALD-BECK, *supra* note 15, at 589 (Rule 156) (asserting that the ICJ and ICTY have insinuated that “an indiscriminate attack amounts in practice to an attack on civilians”).

might negate the need for either a ban or regulations limiting autonomous-weapon use.<sup>386</sup> Moreover, if the ICC follows the reasoning of the ICJ and the ICTY, the operator of the autonomous weapon will be the correct entity to hold criminally liable for an autonomous weapon's actions if the weapon is used to target humans.

Even if the ICC chooses not to adopt the reasoning of the ICJ and ICTY, an autonomous-weapon operator might still be held criminally liable for an indiscriminate attack through domestic court systems.<sup>387</sup> States such as the United Kingdom, Canada, and China (just to name a few) have passed legislation essentially classifying indiscriminate attacks as criminal offenses.<sup>388</sup> Yet, until each state decides cases involving autonomous weapons, it is unclear how each individual state will apply their own unique legislation to autonomous-weapon use that violates the Law of War.<sup>389</sup> What is clear is that whether tried by the ICC or a domestic court system, the operator of an autonomous weapon is the correct entity to hold criminally liable if an autonomous weapon is used against human targets in an indiscriminate attack.<sup>390</sup>

To summarize, there is a very strong argument that the autonomous weapon's operator should be held criminally liable under the Rome Statute for an autonomous weapon's actions. The operator is an appropriate entity to hold criminally liable because an operator makes decisions using both intent and knowledge, and is ultimately the one who decides whether to deploy an autonomous weapon.<sup>391</sup> Furthermore, even if the ICC decides to disregard the ICJ and ICTY's analysis, domestic court systems can potentially hold an autonomous-weapon operator criminally liable for an indiscriminate attack. Thus, regardless of whether the operator is criminally charged

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386. See *supra* Part IV.

387. See generally HENCKAERTS & DOSWALD-BECK, *supra* note 15, at 589 (Rule 156) (stating that "[l]aunching an indiscriminate attack constitutes an offense under the legislation of numerous States"); UK MINISTRY OF DEF., *supra* note 3, at 427, 429 (describing the interplay between domestic court systems and the Law of War).

388. JEAN-MARIE HENCKAERTS & LOUISE DOSWALD-BECK, CUSTOMARY INTERNATIONAL HUMANITARIAN LAW: VOLUME II: PRACTICE-PART 1 251–55 (2005), available at <http://www.icrc.org/eng/assets/files/other/customary-international-humanitarian-law-ii-icrc-eng.pdf>.

389. See generally UK MINISTRY OF DEF., *supra* note 3, at 427, 429 (noting that when utilizing domestic court systems, states apply their own legislation).

390. See Schmitt & Thurnher, *supra* note 7, at 277–78, 280; Aaronson, *supra* note 341.

391. See Schmitt & Thurnher, *supra* note 7, at 277–78, 280; Aaronson, *supra* note 341.



in a domestic court for an indiscriminate attack, or in the ICC for the “[w]ar crime of attacking civilians,”<sup>392</sup> the operator is the correct entity to hold criminally liable for an autonomous weapon’s actions.<sup>393</sup>

*c. The Commander*

Another theory of liability that has gained traction is holding the commander criminally responsible for an autonomous weapon’s actions.<sup>394</sup> There are two different ways to hold a commander criminally liable: individual responsibility for ordering a war crime and command responsibility.<sup>395</sup> Under Article 25(3) of the Rome Statute, “a person shall be criminally responsible and liable for punishment for a crime within the jurisdiction of the Court if that person . . . [o]rders . . . the commission of such a crime which in fact occurs or is attempted.”<sup>396</sup> Therefore, if a commander orders an indiscriminate autonomous-weapon attack, and the attack is then carried out or attempted, the commander can be held criminally liable.<sup>397</sup> Alternatively, if a commander does not order an attack but nevertheless meets certain requirements, the commander can still be held liable for the attack through the doctrine of command responsibility.<sup>398</sup>

Under customary international law and Article 28 of the Rome Statute, a commander may be held “criminally liable for war crimes committed by subordinates. . . . [i]f certain conditions are met.”<sup>399</sup> An important point is that command responsibility is merely a *way* to hold the commander accountable for his or her subordinates’ war crimes and is not a war crime itself.<sup>400</sup> Unless a crime exists, the doctrine of command responsibility is not invoked in the first

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392. ELEMENTS OF CRIMES, *supra* note 334, at 18.

393. *See* Schmitt & Thurnher, *supra* note 7, at 278, 280; Aaronson, *supra* note 341.

394. HUMAN RIGHTS WATCH, *supra* note 2, at 42–43; *see Killer Robots*, *supra* note 4, at 70–71; Stewart, *supra* note 31, at 291–92.

395. Rome Statute, *supra* note 235, art. 25(3)(b), 28; Schmitt & Thurnher, *supra* note 7, at 278.

396. Rome Statute, *supra* note 235, art. 25(3)(b).

397. Schmitt & Thurnher, *supra* note 7, at 278.

398. *See id.*; Smidt, *supra* note 323, at 169.

399. Smidt, *supra* note 323, at 167; *see* Rome Statute, *supra* note 235, art. 28.

400. *See* Rome Statute, *supra* note 235, art. 28.

place.<sup>401</sup> Because an autonomous weapon cannot commit a war crime,<sup>402</sup> a commander cannot be directly held criminally liable for an autonomous weapon's actions.

A commander may be held criminally liable via command responsibility, however, for the acts of an operator. As discussed earlier, an autonomous-weapon operator can potentially commit war crimes.<sup>403</sup> Under the doctrine of command responsibility, a commander may be "charged as a principal to a [war] crime even though the commander did not directly participate in the commission of the actual offense."<sup>404</sup> By customary international law, a prosecutor must prove three elements to invoke the doctrine of command responsibility: "(i) the existence of a superior-subordinate relationship; (ii) that the commander had the requisite knowledge that his subordinate was about to commit a crime or had done so; and (iii) that the commander failed to take the necessary and reasonable measures to prevent or punish his subordinate's criminal conduct."<sup>405</sup>

If an operator commits a war crime by utilizing an autonomous weapon in violation of the Rome Statute or customary international law, and the three requirements of command responsibility are satisfied, a commander can face criminal liability for an autonomous weapon's actions through command responsibility for the crimes of the operator.<sup>406</sup> Thus, the commander can be held liable for an autonomous weapon's actions either directly through individual responsibility, or indirectly through command responsibility.

Despite having far more advanced features and programming, autonomous weapons share at least one trait in common with traditional weapons of war; their use is controlled by humans, and as such, it is the human decision to deploy an autonomous weapon that must undergo legal scrutiny.<sup>407</sup> Consequently, rather than being solved through new treaties, the accountability issues regarding

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401. Joakim Dungel & Shannon Ghadiri, *The Temporal Scope of Command Responsibility Revisited: Why Commanders Have a Duty to Prevent Crimes Committed After the Cessation of Effective Control*, 17 U.C. DAVIS J. INT'L L. & POL'Y 1, 5 (2010).

402. *Supra* Part V.B.2.a.

403. *Supra* Part V.B.2.b.

404. Smidt, *supra* note 323, at 167.

405. Dungel & Ghadiri, *supra* note 401, at 6; Sean D. Murphy, *Doctrine of Command Responsibility in U.S. Human Rights Cases*, 96 AM. J. INT'L L. 719, 721 (2002).

406. *See generally* Rome Statute, *supra* note 235, art. 28 (discussing command responsibility under the Rome Statute).

407. Schmitt & Thurnher, *supra* note 7, at 277–78, 280.

autonomous weapons are essentially solved through application of customary international law.<sup>408</sup> In sum, the laws and treaties currently in effect assert that the appropriate entities to hold criminally liable for an autonomous weapon's actions are the operator who deployed the weapon and the commander who either supervised the operator or ordered the deployment.<sup>409</sup>

## VI. CONCLUSION

Autonomous weapons are situated in a unique predicament. They have developed to a point justifying legal analysis, but the “window of opportunity to design a relevant governance or oversight system” is closing.<sup>410</sup> Recognizing this immediacy, “[t]he United Nations Special Rapporteur on extrajudicial, summary or arbitrary executions, Christof Heyns, . . . called for a global pause in the development and deployment of” autonomous weapons.<sup>411</sup> He emphasized that the time to be discussing the legal ramifications for utilizing autonomous weapons is now.<sup>412</sup> States need to discuss potential restrictions on autonomous-weapon use “before governments and big companies become invested in the technology—and begin to influence the direction of policy.”<sup>413</sup>

Although the current Law of War is “sufficiently flexible”<sup>414</sup> to cover regulation and accountability issues regarding autonomous-weapon use,<sup>415</sup> it is not clear that all states will agree on the extent to which customary international law restricts such use. As such, this Article has three recommendations. First, and most importantly, states should acknowledge that autonomous-weapon use is limited by customary international law and punish any violations in their respective domestic courts. Second, the ICC should follow the reasoning of the ICJ and ICTY by declaring that indiscriminate attacks can equate to attacking civilians, and considering the features and accuracy of weapons used when determining if an attack was intended for and aimed at civilians. Finally, if states decide to create

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408. *See id.* at 279–80.

409. *Id.* at 278, 280.

410. Marchant et al., *supra* note 9, at 314.

411. *UN Human Rights Expert*, *supra* note 6.

412. *Id.*

413. Subbaraman, *supra* note 160.

414. Stewart, *supra* note 31, at 293.

415. Schmitt & Thurnher, *supra* note 7, at 279–80.

a new treaty regarding autonomous weapons, such treaty should mandate that autonomous-weapon operators obtain sufficient training before deploying autonomous weapons. Sufficient training can potentially prevent indiscriminate attacks by educating operators about the limited circumstances in which autonomous weapons can legally be deployed.<sup>416</sup> In conclusion, the international community can use the existing Law of War to both regulate autonomous-weapon use by limiting it to non-human targets, and address accountability issues by holding the operator and commander criminally liable for an autonomous weapon's actions.

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416. See generally ANDERSON & WAXMAN, *supra* note 14, at 11, 17 (discussing how autonomous weapons “might be deemed inadequate and unlawful” in certain situations, “but lawful” in others).

